COMMODORE MAGAZINE

VOL. 3
ISSUE 6

- ★ Commodore Music
- ★ Stockmarket Simulations
- ★ A Background to BASIC

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The objective of this magazine is to disseminate information to all users of Commodore computer products. This magazine contains a variety of information collected from other Commodore publications, and generated locally. Contributions from all Commodore User Groups, and individual users are encouraged.

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2067 NSW
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PLEASE NOTE: To provide a good information service to Commodore users, we will regularly mention equipment, software and services offered by companies and individuals not directly related to Commodore. In doing so, we are not making recommendations, and cannot be responsible for the validity and accuracy of any statements made.

EDITORIAL . . .

We've got to the end of volume 3 – (PHEW!) – and what a volume it has been. The magazine has seen a transition from that of a Commodore owned and published publication to a magazine produced by an outside publisher (Computer Reference Guide).

A transition like this is not as simple as it may seem but we are through the worst of it now (I HOPE!).

What of Volume 4? No. 1 is due in mid March and will be a special issue on Graphics for the CBM/VIC/64 with product reviews, books and of course program listings and articles.

Almost daily I am receiving new books, software and peripherals for review etc., in the Commodore Magazine. I had no idea of the vast numbers of products available for the Commodore range of computers.

Next volume we hope to bring you some information and details on the new range of Commodore Business equipment. The magazine is a little at Commodore's mercy on this one though.

Volume 4 will be a new look magazine crammed with listings, articles and reviews. There will be an increase in Australian content. I believe it may even start turning out on time ! OH JOY!!

Well folks, get your subscriptions in, the show is about to start.

Mervyn Beamish

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How to make the best home computer in the world even better.

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With the Commodore VIC 20 Computer, you have the finest home computer money can buy. And the more you use it, the more you will ask it to do.

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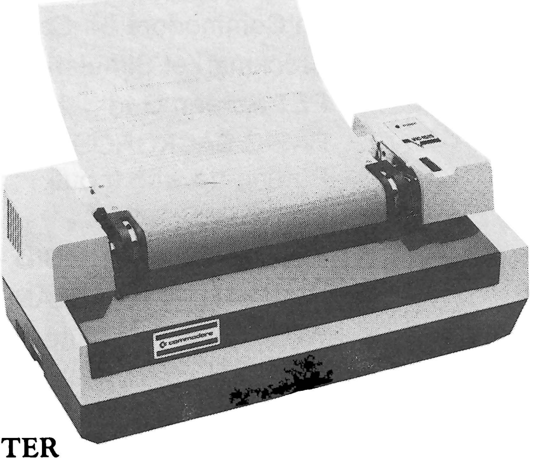

VIC PRINTER

The VIC Printer, like all VIC peripherals, offers a very high specification at a very competitive price.

It will print programs, letters, business data, graphic displays and so on.

Its main features include: 80 characters per line • Tractor feed dot matrix • 30 characters per second print speed • Full alphanumerics and graphic printing • Double-size character capability.

VIC FLOPPY DISK UNIT

The VIC single-drive Disk Unit provides a fast, accurate and efficient means of storing and retrieving data and programs.

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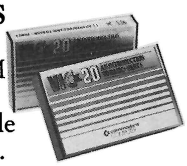
Features include:
174,848 bytes capacity
• Uses soft-sectored standard 5¼" single density floppy disks
• Direct interface to VIC
• Direct compatibility with Printer
• Intelligent system independent of VIC.

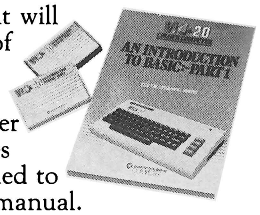
EXPANSION MEMORY CARTRIDGES



Special plug-in cartridges are available to expand VIC's memory. 3K, 8K and 16K RAM packs plug directly into the computer.

A Memory Expansion Board is also available to develop VIC's capabilities to the maximum.

1. Introduction to Basic



This package contains materials that will enable you to learn the fundamentals of programming in the BASIC computer language on your VIC 20 computer. It assumes no prior knowledge of computer programming and includes two cassettes containing 17 programs specially designed to accompany a comprehensive 152 page manual.

2. Progamming Aids

To aid programmers to write their own programs, Super Expander, Machine Code Monitor and Programmers Aid cartridges are available.

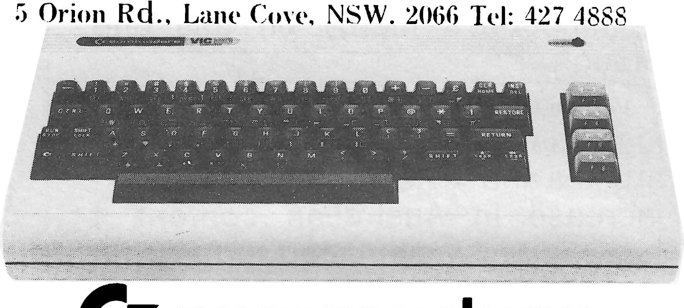
3. Games

The VIC 20 has the largest selection of cartridge and cassette-based games available on any personal computer. VIC 20 games offer a real challenge and take a great deal of skill, time and mental agility to win.

4. Joysticks and Paddles

These accessories make playing games on the VIC even more enjoyable. The joystick has even more practical uses and can be used with high resolution graphics to draw pictures or help with graph plotting.

For full details of VIC 20, its peripherals and software, and a list of your local dealers, contact:
The Commodore Information Centre,
5 Orion Rd., Lane Cove, NSW. 2066 Tel: 427 4888



commodore

VIC 20

A real computer for the price of a toy.

MLVL 1613

PUTNEY SCOUTS

Be prepared ...... Well, the small 1st Putney Cubs, Rovers and Scout Group in Sydney are well prepared for the computer age. Commodore microcomputers are playing a part in the running, entertaining and fund raising activities of the group.

1st Putney recently raffled a VIC-20, DATACASSATTE and SOFTWARE (kindly donated by Commodore) to raise funds for the group and over $600 worth of tickets were sold.

Each year the group holds a father and son night which includes a meal, entertainment etc. Last year the entertainment (voted the best ever) was a VIC-20, COMMODORE 64, CBM 4016 and an INTRA (Apple look-alike). The 'boys' played a number of games including MUTANT CAMELS, NIGHT DRIVE, EVOLUTION and TORNADO. The only way organisers could get people to leave was to 'pull the plug' (no damage done thank goodness).

Each month the 'SCROLL' or newsletter is produced using WORDCRAFT 20 on a VIC-20. The newsletter is put onto tape and sent off for typesetting and printing.

At Christmas '83 the Commodore 64 using SYNTHY-64 was a great hit. The C64 supplied background music and accompaniment for carol singing.

This year the group intends using Commodore Computers to keep records on Badge work etc. carried out by the boys. Also they are looking at computerising the Treasurers books.

Scouts often spend time on the computers. The rule is half an hour programming tuition before you can play computer games.

NEXT ISSUE Vol. 4 Issue 1
- MID MARCH -

- ★ **Special Graphics Issue Review:**
  - **Paintpic**
  - **Koala Pad**
  - **Screen graphics-64**
  - **CBM/VIC/64 Books**
- ★ **Program Listings for CBM/VIC/64**
- ★ **A look at LOGO, TURTLE & PILOT**

And Much More

IT'S OUT!!!

Well, away and kicking anyway. Yes folks, the much talked about and heavily saught after VIC Centre Menu (Menu?!) has gone to the printer and should be out by the time you're reading this magazine.

The Menu started out as The VIC Centre Autumn Catalogue. It has now expanded (and expanded!) to a 152 page publication; a software, hardware and print reference handbook.

The Menu contains the most comprehensive listing of material available for the VIC and C64 in Australia.

Each item is briefly described and 99% have their recommended retail price listed.

There are at least 15 pages from Commodore of their own soft/hardware as well as Technical Tips.

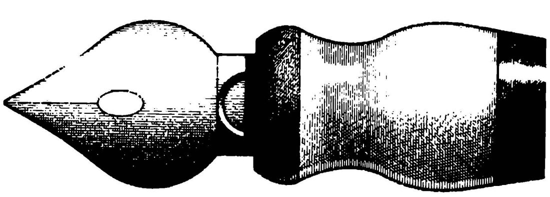
From High Technology in Melbourne, Nick Hampshire in London, Abacus in U.S.A. and yours truly there are several pages of Technical Tips and listings.

Amateur Radio also features in The Menu – including some comprehensive articles on RTTY and AMTOR.

Nigel Shepherd, Managing Director of Commodore in Australia, has written the Foreword has given Commodore's stamp of approval on the publication.

Want one? They cost $2.50. Try your local Commodore dealer or write to THE VIC CENTRE, 416 Logans Rd, Stones Corner, QLD.

LETTERS TO THE EDITOR



Dear Sir

I have received the fourth issue of the Commodore Magazine in which my program entitled 'SNAKE' was published and, in typing out the program listed, have noted some errors.

The lines in which the errors occurred have been re-written below:-

```
16 POKEB,93:NEXT:POKE8185,125:FORC=8184TO8165STEP-1:POKEC,64:NEXT:POKE8164,109
80 X=X+XM:POKEX,102:J=J+1:N=N+1:IFN=50THEN POKEF,32:N=0:GOTO19
100 POKE36878,0:N=0:FORG=1TO4:S=INT(RND(1)*20)+1:FORI=7702+STO7702+S+20*22STEP22
620 PRINT"█M=DOWN"
```

Yours Faithfully, D. Taverner Coffs Harbour, N.S.W.

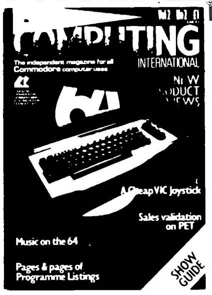
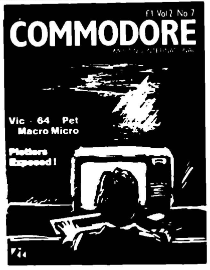
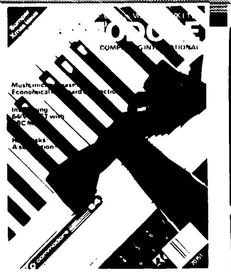
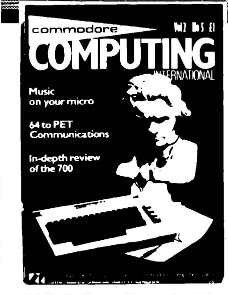
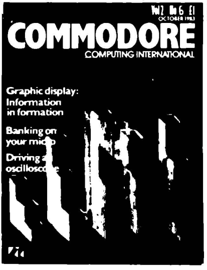
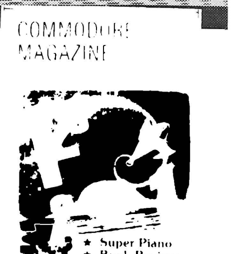
Dear Sir,

I wish to have a bit of a grippe: I subscribe to the Commodore Magazine but have only received three of the prescribed 6 issues. I am wondering if there is any particular reason for this as it is half way through the eleventh month of the year. I would think that one issue every two months would be more appropriate!

I purchased the Home/Business Calculation pack (for the VIC-20) produced by Commodore and found them all very good except one. I use a 16K expander with my Expense Calendar (No. VT 1010) and have found that it will not save any written data. The computer just crashes in the process of saving. The program works fine in the unexpanded version but won't save when expanded with a 16K expander. could you please advise me on rendering the problem; I have tried and could find no obvious mistakes. I use a datasette.

My last gripe is sort of a nice one. I also purchased a Programmers Reference Guide. While the book is excellent in all its written material, (WELL DONE), it is the binding with which I am concerned. There seems to be too many information filled pages for the plastic binding. This means that the book fails to open correctly and makes it hard to read. With constant use both of my covers became very tattered. Many of the last dozen pages come of the binding, either slipping off or ripping with constant stress. I hope you will be able to rectify this and advise me on my other queries. Thanking you.

Yours Faithfully
Phillip Koschitzke Warracknabeal, Vic.

KiM BOOKS MAGAZINES

COMMODORE COMPUTING INTERNATIONAL $5.50 per issue Plus P & P
Vol 2. No 2 – June 83
Flight plan on 8000 series, 4th International Commodore Computing Show, Project Planning Review, CP/M, Vic & 64 Games listings, Music–C64, IEEE for VIC & 64, Low cost Joystick, Sales Validation Sprite Editor, Tech Hints, BASIC & ML Programs.

Vol 2. No 7 — November 83
Breakthrough in teaching reading by computer, New Games, Three new programs, New Products: VIC 20 Motherboard, ZX Printerface, Another look at BASIC, Plotters round-up, Hints & Tips

Vol. 2 No 8. December 83
Bumber Christmas Issue Latest Hardware/Software for personal computers, Puzzles, Music, Games (Arcade/Adventure), Business Software/Hardware, Entertaining programs, Useful Routines.

Vol 2. No 5. — September 83
Music on Your Micro, 64 to PET communications, 700 review, Review High Flyer & Monopoly, History of Computing, Book Reviews, Inside VIC Cassette Deck, VIC, 64 & PET communctns, Starfleet Command, Moon Lander, BASIC & ML Prgms.

Vol 2. No 6 — October 83
Graphic display, Banking on your Micro, Driving and Oscilloscope, Book & Games Reviews, Printers & Intrefaces, Wordprocessing, Horse Race, Fruit Machine, Tech Hints & Tips, BASIC & ML Programs.

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A growing Applications Manual for your Commodore computer — News, Reviews, Listings, Tech Tips and Hints, Special articles from all over Australia, New Zealand & the World.

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ED: – No. 6 is now out! Your gripe regarding lateness of mag is correct and we shall try to pull our socks up. Sorry but we can't suggest anything about the Expense Calender, perhaps one of our readers can assist.

January 4, 1984

Dear Sir

Here is an article from 'The Age', 23 December, 1983 that might be of interest to you.

The issues surrounding this story have been of great concern to ourselves as to Melbourne House, Anirog and Commodore. I would like our dealers to feel confident with the quality and legality of the product they promote and sell. Computer Reporting Services is an authorized wholesaler and supplier of all Anirog and Melbourne House products; consequently the quality and the legality of the product is guaranteed.

This is true across our whole range of software and books. We are all aware that a book and software submarket exists, but in the long term this will only serve to damage the reputation and businesses of all who use it.

Computer Reporting Services supplies all publisher's books and software at recommended Australian retail prices, and at the retailers discount available from that publisher.

Our latest price list, containing over 800 titles will be released in two weeks: a copy will be posted to you as soon as possible.

Yours faithfully

JULIAN TOL

Wholesale Manager

ED – Glad to see there is some action on this topic. And whats more successful action. Congratulations.

THE AGE,
Friday 23 December 1983

A Federal Court judge yesterday granted an interim injunction restraining a Perth company from selling 11 video games after three computer companies had claimed that their copyright in the games had been infringed.

The applicants claimed that they owned the copyright in the cinematograph films of the videos and in the artistic and/or literary works of the packaging in which the videos were sold.

They also accused the respondents, Yelts Pty Ltd (trading as International Software Importers) and Maurice John Lamberth of conduct in trade or commerce that was misleading or deceptive or likely to mislead or deceive. Such conduct is covered by section 52 of the Trade Practices Act.

In Melbourne Mr Justice Smithers granted the interim interlocutory injunction until 11 January 1984 after an application by Melbourne House (Australia) Pty Ltd, Anirog Software Limited and Commodore Business Machines Pty Ltd.

The order restrains Yelts and Mr Lamberth from importing or copying, reproducing, duplicating, making, selling or offering for sale the video games Galactic Abductor, Xeno II, Dot Man, Pharoaph's Tomb, Frogrun, Seven Games Vol I, Slab Dab, Zoks Kingdom, Mini-Kong, Frog Run and The Hobbit.

Early this month Mr Justice Beaumont ruled in the Federal Court in another case that, in effect, computer programs could not be copyrighted in Australia.

Apple Computer, which had alleged that another company had sold micro computers containing three silicon chips which infringed copyright, has appealed against the decision.

Dear Mervyn,

Thank you for the Super Piano program in Commodore Magazine 3/4. I have not submitted a tune as I am more tone deaf than you! and also because I find it difficult to control time a note sounds. Incidentally I found that the program did not work properly until I made the following small change:

```
355 IF M = 1 THEN 310
```

I hope this is worth a ROMIK cassette!

R.W. SINCLAIR
Bellevue Heights, SA

ED: – Could you pitch that a bit higher? Didn't quite get you. If music is not your game, obviously you have some knowledge of BASIC, why not try Adventure Programming. Thanks.

Dear Mr. Beamish

I hope this letter reaches you by the 15th December 1983, if so I wish to enter your Super Piano Contest.

Please find enclosed a tape and the money to pay for its return. My saved tunes are on side B of the tape in the following order– Doe-a-Deer, Mickey Mouse Club March and Chariots of Fire (Chariots of Fire ends rather abruptly because I ran out of memory and had to modify the tune).

Thank you for your time,

Thomas Tilley Coomandook, S.A.

ED: – Mr Tilley has won himself a Romik game

ADVENTURES

By Mervyn Beamish

This is the second part of our collection of Computer Adventures and associated publications.

One reader said he said my remarks on graphics adventures last issue were a little vague. I am afraid that this is because the definition of a graphical adventure is vague.

An Adventure to me has to have certain qualities:-

1. You have to think, the machine doesn't do that for you.
2. You have options. A good adventure can have two or three ways of achieving the same goal.
3. There is a solid story line.

Software producers are taking a different view and many are packaging a number of 'Arcade' type games with a common theme (usually very thin) and calling the Graphical Adventures. Personally I believe this to be a miss use of the term.

While we are on the topic of this style of Graphical Adventure it should be pointed out that this is possibly a very good way of purchasing 'Arcade' games as you usually get about six to eight games or variations for the price of one and they are generally of quite good quality.

The reviews that follow are of Text Adventures on the VIC-20 and C64, three 'true' Graphic Adventures from Photronics, two 'Arcade' Graphic Adventures and a couple of Strategic games. You see we try to be fair in our coverage of the topic (I hope).

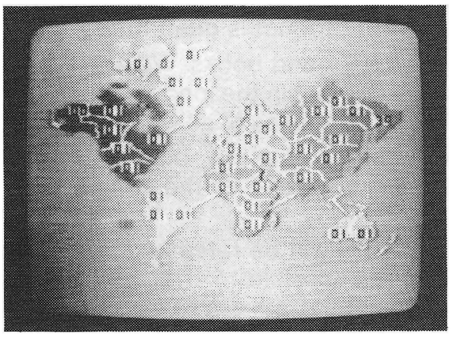
PHOTRONICS

I received the following three Photronic games virtually straight from the custom shed. Here in front of me in a brown paper bag were three games for the C64 on disk, three colour coded dongles (yes, the games are dongle protected) and some photographs of what I assumed to be artists roughs for the packages.

Checking with the distributers I find that you will receive your games in neatly packaged with an instruction sheet as well. Also the photographs were of finished art. In that case I would not go overboard about the packaging graphics, your local primary school could do better.

The three games where:

ARMAGEDON



A game of tactics and strategy for two to four players. Each player attempts to gain complete control of all territories in the world by means of attacking and defending neighbouring territories. First player to gain overall control is the winner.

Armagedon can be played by two to four people. Each player is given an armed force to handle and deploy. Each player doesn't get the same size force but may find that on the map (on the screen) one players territory is more strategically placed than others thus the balance is made.

Troop deployment is made by moving the cross bar over the territory and locking in the force (you nominate the size) with the fire button on the joystick or the relevant key on the keyboard. The game can be played with the joy stick or the keyboard.

You conquor another player's territory by similarly pushing the space bar and the fire button. Sounds relatively simple especially when you consider that the players don't play turn about but rather one player goes until he decides that he has done enough and then passes over to the next player.

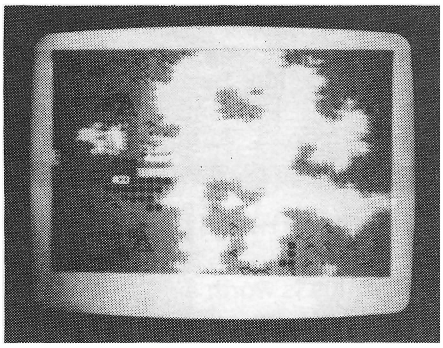
Well, what is the challenge?

The more territory you conquer the thinner the spread of your forces, also you cannot attack a country that doesn't have an army on it an in many cases there is no way of telling if there is one there or not. It is possible to be tricked into planning a whole campaign on attacking a continent to find that there are no forces there to fight and then watch helpless as your now weakened forces being attacked by the massed forces of the other players.

This is an Adventure game of strategy and if there are more than two players, political intrigue.

BLACK GOLD

Black Gold is a mining stratergy game for two to four players. Each player operates an oil well and the object of the game is to earn one million pounds by exporting oil overseas by means of transporting crude oil from a well to the oil refinery by means of a tanker. The first player to reach one million pounds is the winner.



This is for two to four players using the keyboard only. Very interesting graphics on this game which is a simulation of the oil industry. Fedral taxes, pipeline fires, industrial disputes and over production from oil wells are all part of the game.

Again a deceivingly simple game that becomes a struggle between giant oil magnates.

My ten year old son, Kim, and I tested this one and I'm contemplating letting him run the business and I'll go back to school.

Continued on page 35

Conqueror

(for VIC 20 with 16K expansion)

Reviewed by *Mervyn Beamish*

CONQUEROR comes in quite a nice little package. (*Does it come in any other colours and is it safe for children?*)!

A suitably illustrated box which contains six pages of easy to understand playing instructions, a large pack of 'tiddle-winks' (plastic markers), a large table top map of Medieval Europe and a cassette. Everything is nicely produced and entices you to get into the game.

This is where we (my guests and I) had trouble. The sample pack I was given must have been a programmers experimental copy. Although the pack said VIC 20 16K, we could only get it running on the right hand 20 character width of the Commodore 64 screen.

However we got the game up and were soon very engrossed in what could be defined as a board game with computer support. It was good. Soon across the table my father-in-law, King of Noricum (can't understand all this new fangled technology etc) was forming a political alliance with my wife, King(?) of Lusitania to buy her wheat. She in turn would hire his mercinaries for an attack on King Mervyn of Britannia. Well, I must admit I did have the biggest army, most co-operative serfs and was virtually self sufficent in everything but plowshares - (I'd melted them down to make swords for my pillaging of Galia and Belgica.)

The conquest of Europe, in our case took a couple of hours – that is before an armistice was called – on the computer at least – for a nice cup of tea and a biscuit. I did offer to supply the wheat but they refused!?

Basically to play the game you load in the program, set the map on the table around which 1 to 15 players sit; select your token and away you go.

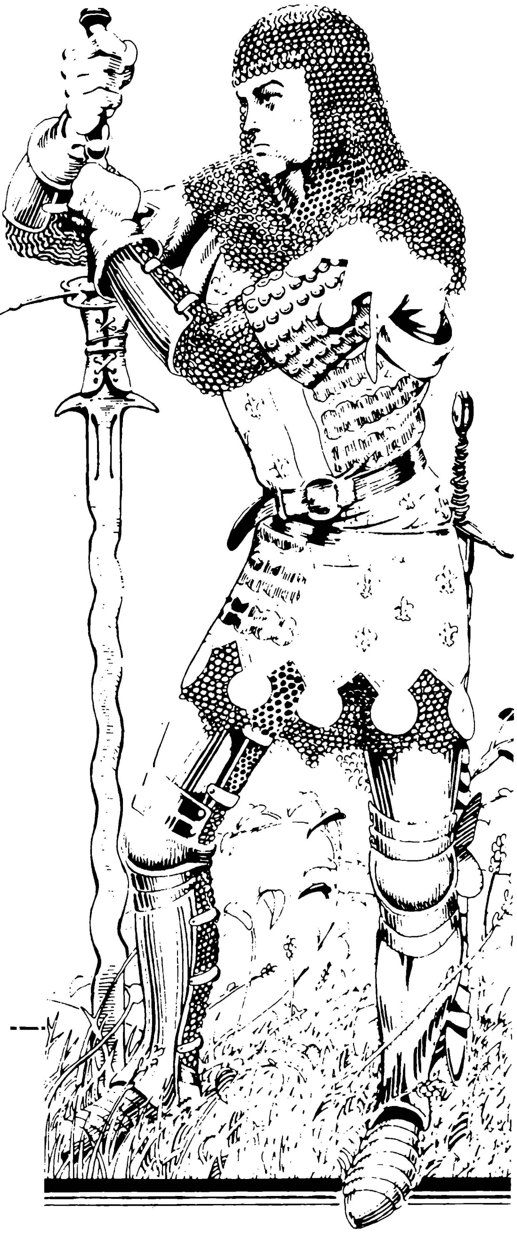
After logging-in – everybody is a King (sexist) – you are allocated a kingdom, a quantity of gold, wheat, iron and soldiers. Also you are given a population who have gold and wheat. The population of serfs is for taxing but they can be rather revolting if taxed too much.

There are four season to the year and you must feed and pay your soldiers and people for four seasons, CONQUEROR is actually played in three seasons; Winter, Spring, and Autumn/Fall. Did the programmer take his holidays in Summer??!

You have access to status and census reports and at the end of each season there is a market place where people can buy and sell products, services. This is really where the main battle takes place and alliances are formed. players true personalities come to the surface here.

One problem – the game does not have sufficient fail-safe routines i.e. it is very easy if one player is operating the keyboard to accidently (or on purpose) pass over another players turn and there is no way of going back and correcting this.

The game is a little more complex than Monopoly just as compulsive and definitely a good family game whether the players are computer enthusiasts or not.



TITLE: .... CONQUEROR
AUTHOR:.................. Bill Davison
PRODUCER:....... Computer Software Asscociates.
PRICE:.......................... $44.00
SAMPLE FROM:
PITTWATER COMPUTER
22 Carter St.,
Brookvale NSW
939-6760

ZORK

For the C64

CHAPTER 1 THE ZORK TRILOGY

"To travel, " they say, "is better than to arrive", and this couldn't be more true of adventure games, which increasingly dominate the home computer software market. This month we commence a series, which provides an in depth look at the most popular, adventure, software coupled with the hints and tips of a 'hardened' player.

QUEST FOR ADVENTURE
THE COLLECTED EXPERIENCES OF A SEASONED TRAVELLER

Although the microcomputer games industry is still very much in its infancy, it has already given life to a very special type of game that has, in turn generated a huge and devout following. I am talking of Adventures, of course. Adventure lovers come from an astonishing cross section of micro owners, from schoolboys to pensioners, from vicars to viscounts, from those to whom programming is forever going to remain one of life's mysteries to those who can handle assemble a 48K machine code program while eating their breakfast.

BOYS OWN STORIES

For those poor souls who have not yet discovered the delights and fascination of Adventures, they can be best and briefly described as interactive books. Playing an Adventure is rather like reading a novel, the big difference is that you are the main character in the story and that your actions govern how the tale unfolds. The story is only revealed piece by piece – much of the pleasure lies in extracing further parts of it from the author – by wit logic, cunning, brute force or lucky chance. You can not simply turn to the last page to find out the ending – progress towards a particular point point in the Adventure depends on your handling of situations en route.

Adventures often have many routes to a successful (or unsuccessful) culmination – the fun is getting there.

ZORK

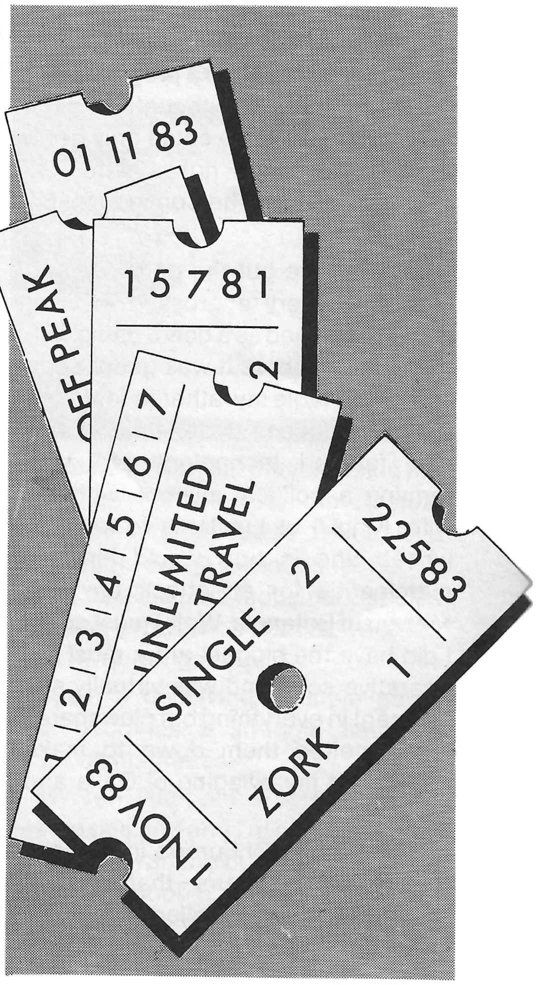
Lets us look at the Queen of Adventures, Zork. Voted recently as the most popular Adventure, its acclaim can be judged by the fact that it even has its own user group (*England*). Three cheers for Infocom (the Publishers), there are now three Zork adventures to satisfy your hunger for a detailed imaginative Adventures – a trilogy no less.

The extracts should give you some of the flavour of these delicious Adventures but, to start the show, here's an outline of each episode to wet your appetite.

THE PLOT THICKENS

The Great underground Empire (Zork I) is a large and mysterious subterranean realm. Legend has it that there are vast amounts of treasure lying within, waiting for the right moment Adventurer to come along and claim them. However the Empire is vast and complex and will take much exploring before all its secrets will yield to your probing. The land is not without its dangers and it may be necessary for you to fight for your treasure, perhaps even your life on occasion. Beware the thief who is likely to slit your throat as to steal your purse.

The Wizard of Frobozz (Zork II) takes you down into the new and unknown depths of the Empire. This long-hidden region is now governed by the Wizard of Frobozz, who was once the Personal Scorceror of Lord Dimwit Flathead the Excessive. The Wizard has grown somewhat absent minded with the passing of time yet this has only marginally affected his great and wonderous powers of magic. He still rules the cavern with an iron will and is to be underestimated at one's peril. Fabulous treasures are believed to be hidden here but there are many diabolical puzzles and exotic creatures to deal with before an Adventurer can hope to have an age of wealth and idleness. Ancient manuscripts and other literature may well offer assistance for the long and strange journey ahead.



The Dungeon Master (Zork III) is the final test of an Adventurer's wisdom and courage. Charting further regions of the Great Underground Empire, the Adventurer must determine the purpose for which he has been brought hereand will eventually be brought to a confrontaion with the Dungeon Master himself.

ENGLISH SPOKEN HERE

One of the very good things about the Zork programs is the parser. Instead of giving orders by the usual method of two word input (normally a verb followed by a noun), Zork accepts simple sentences and multiple phrases, can cope with adjectives and prepositions, and even make deductions from incomplete commands. It's worth looking at a few examples to give an idea of how powerful the parser is and just how much depth this ability adds to the realism of the Adventure.

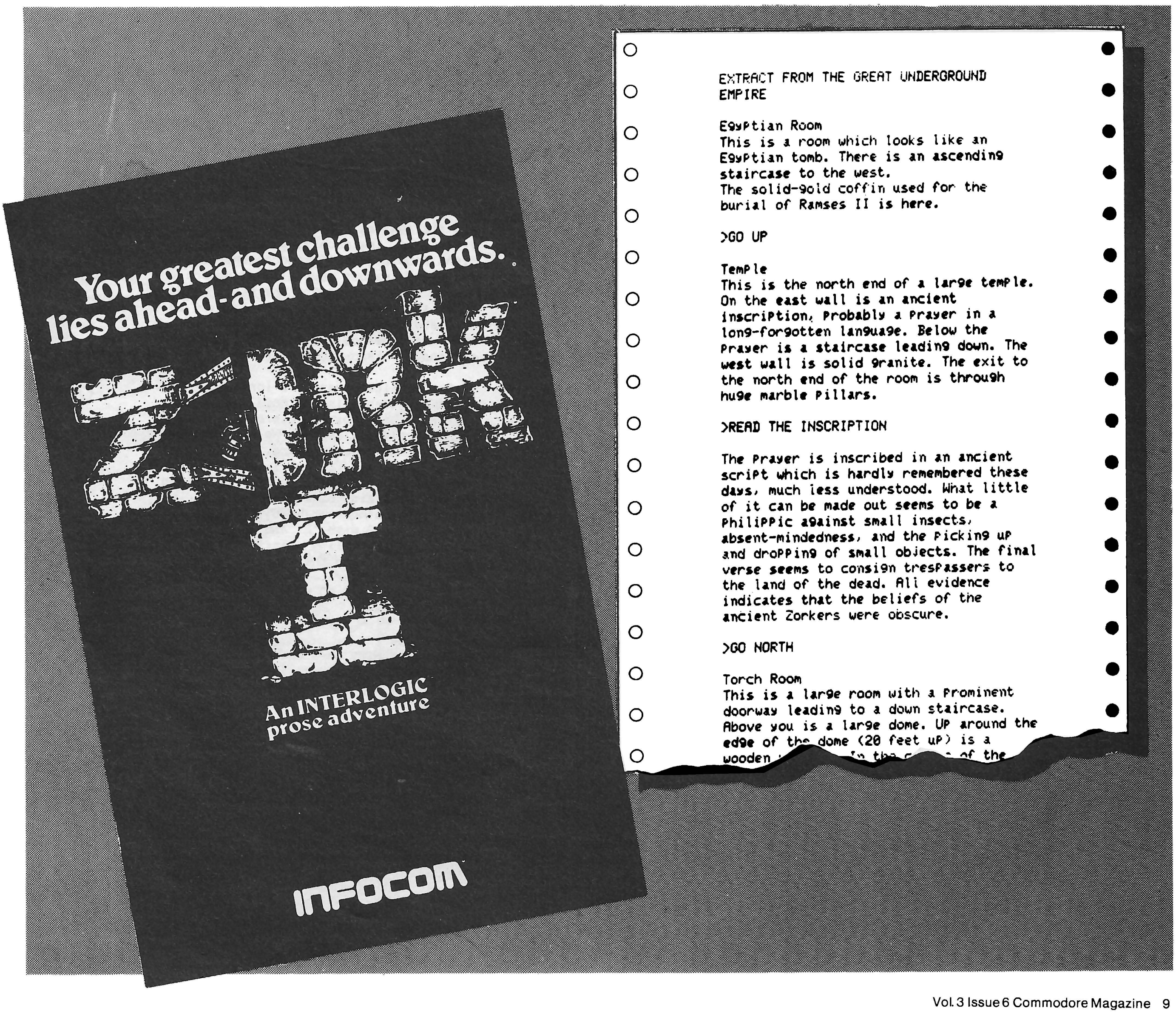
If there were several objects in a room and you wanted to collect them all with the eception of a book and a knife, you could say: "Take all but the book and the knife". If you wanted everything, you could say: "Take all". Objects can be retrieved from or placed inside, other objects: Throw the knife in the bag and the sword, the book and the magazine in the chasm. Other prepositions can be handled: "Look in Bag. Look under Rock. Look behind curtain.

Multiple phrases are accepted: "Go North. Take the gold. Open the door. Read the book". Zork will accept this as one input and deal with each command, and its consequences, in turn. The same effect can be accomplished by using "then": "Go east then drop the candle". Adjectives are sometimes needed to distinguish between similar objects: "Read the red book then open the iron door". If your command is ambiguous ("Close the door" when there are is both an iron and wooden door in the vicinity), Zork will ask you which one you are referring to. In response to Zork's question, you merely need to type in the appropriate word (e.g. "Wooden") for Zork to associate it with your previous statement and act accordingly. If you command is incomplete Zork will endeavour to understand your intention: providing you are carrying a sword, "Kill troll" will be as "Kill the troll with the sword" – Zork assumes that you want to use the sword, and that you don't prefer to attack the vicious axe-swing troll with just you bare hands!

You may ask Zork questions using the command words "What" and "Where": "what is a grue? Where is the troll?"

In Zork II and III you can even communicate with other creatures: "Tell the Wizard 'Get the gold' ", or: " Tell the Dragon 'Go North' ".

If the mood takes you, you can talk "out loud": "Say 'Hello Sailor' ", or: "Answer 'A lemon' ".


Your greatest challenge lies ahead-and downwards.
ZORK I
An INTERLOGIC prose adventure
INFOCOM

```
EXTRACT FROM THE GREAT UNDERGROUND
EMPIRE

Egyptian Room
This is a room which looks like an
Egyptian tomb. There is an ascending
staircase to the west.
The solid-gold coffin used for the
burial of Ramses II is here.

>GO UP

Temple
This is the north end of a large temple.
On the east wall is an ancient
inscription, probably a prayer in a
long-forgotten language. Below the
prayer is a staircase leading down. The
west wall is solid granite. The exit to
the north end of the room is through
huge marble pillars.

>READ THE INSCRIPTION

The prayer is inscribed in an ancient
script which is hardly remembered these
days, much less understood. What little
of it can be made out seems to be a
philippic against small insects,
absent-mindedness, and the picking up
and dropping of small objects. The final
verse seems to consign trespassers to
the land of the dead. All evidence
indicates that the beliefs of the
ancient Zorkers were obscure.

>GO NORTH

Torch Room
This is a large room with a prominent
doorway leading to a down staircase.
Above you is a large dome. Up around the
edge of the dome (20 feet up) is a
wooden
```

Zork understands all the traditional commands such as "look", "go", "take", "score", "inventory", etc. It distinguishes words by their first six letters so you can abbreviate your commands; compass points, as in most adventures, can be truncated to N, S, U (up), SW, etc.

As I hope you see from the overview, this powerful feature adds considerbly to the realism and enjoyment of the experience – playing Zork can really be an experience!

CHARACTERS AND COMBAT

Another one of Zorks features is that most characters you meet have distinct personalities. No cardboard cutouts these but warm (or cold) blooded, three dimensional individuals. One such is an aristocratic theif. In a fight, he may well salute your prowess but his high breeding will not prevent him from stealing your possesions. He may respect your ability but if you are knocked unlucky enough to be knocked unconcious, all his admiration will not stop him from slitting your throat while you slumber.

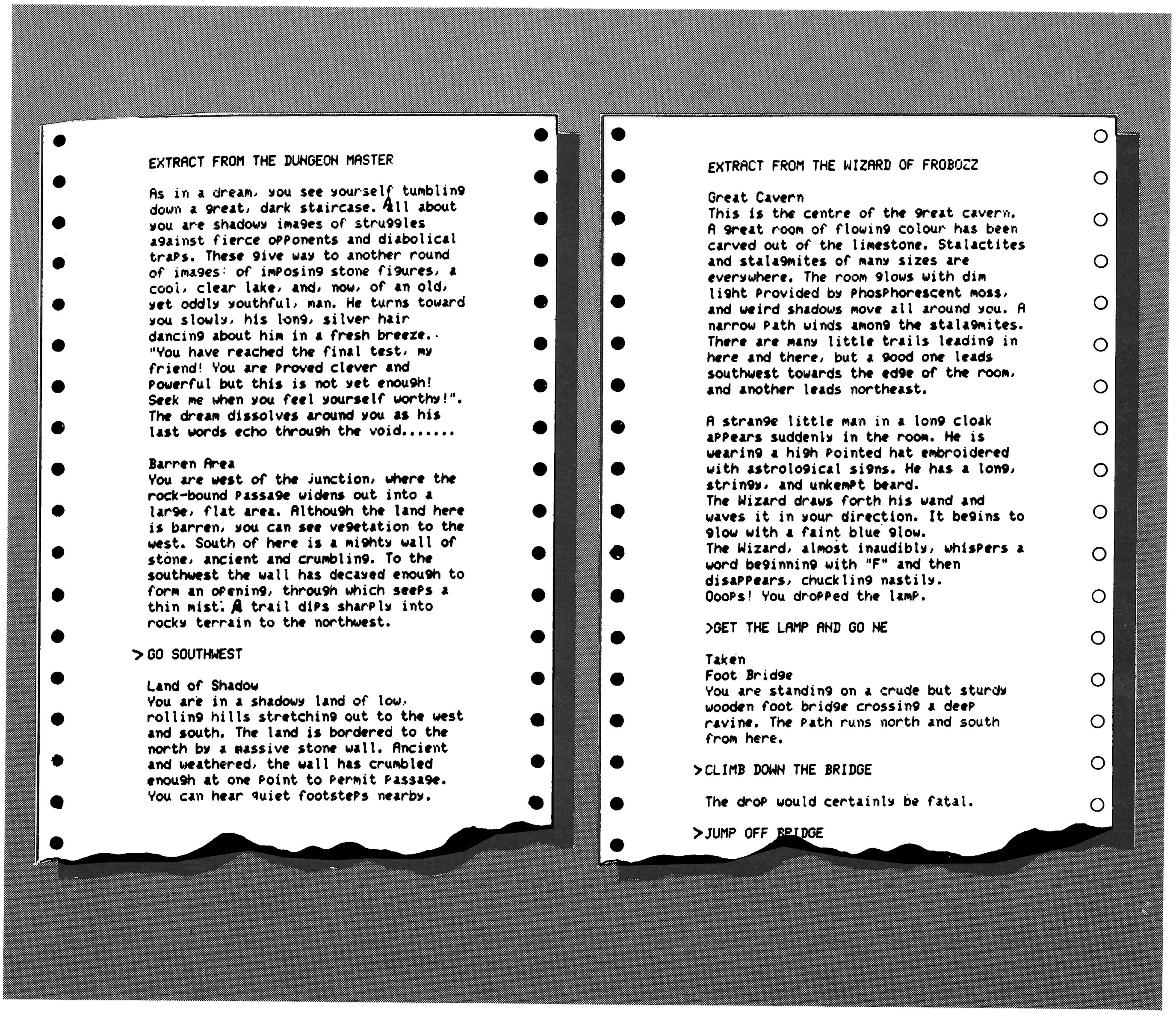
On occasions, the thief can seem to dog your footsteps and yet, like a policeman, when you want him he's never around. One of his less endearing habits is to frustrate your map making. Methodically charting a maze (where all locations look alike) by the traditional method of dropping an oject in each room, you will be a trifle put out when, in the near distance, you hear the thief shout, "My! What is this fine sword doing here?" You shouldn't be surprised to find the sword has gone missing when you return to the spot where you originally left it.

Fights are described in detail. Whether you are victorious or not depends solely on your wit and weapons. If you engage a bloodthirsty, axe-brandishing Troll your bare hands, you shouldn't be surprised to find yourself, literally, holding your head in your hands. Let me hasten to reassure those of a gentle nature that in fact there is very little violence in Zork. There are far greater challenges than the purely physical waiting for the Adventurer.

PUZZLES APLENTY

Zork has a variety of puzzles and mysteries which are guaranteed to have your brain cells going flat out.

What would happen if the dam floodgates were opened, assuming they can be opened? What is the secret of the Jewel encrusted egg? Who or what is a Grue? Of what use is the silver hand bell? How does one mollify a hungry giant who, in all senses, enjoys having people for



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EXTRACT FROM THE DUNGEON MASTER

As in a dream, you see yourself tumbling
down a great, dark staircase. All about
you are shadowy images of struggles
against fierce opponents and diabolical
traps. These give way to another round
of images: of imposing stone figures, a
cool, clear lake, and, now, of an old,
yet oddly youthful, man. He turns toward
you slowly, his long, silver hair
dancing about him in a fresh breeze..
"You have reached the final test, my
friend! You are proved clever and
powerful but this is not yet enough!
Seek me when you feel yourself worthy!".
The dream dissolves around you as his
last words echo through the void.......

Barren Area
You are west of the junction, where the
rock-bound passage widens out into a
large, flat area. Although the land here
is barren, you can see vegetation to the
west. South of here is a mighty wall of
stone, ancient and crumbling. To the
southwest the wall has decayed enough to
form an opening, through which seeps a
thin mist. A trail dips sharply into
rocky terrain to the northwest.

>GO SOUTHWEST

Land of Shadow
You are in a shadowy land of low,
rolling hills stretching out to the west
and south. The land is bordered to the
north by a massive stone wall. Ancient
and weathered, the wall has crumbled
enough at one point to permit passage.
You can hear quiet footsteps nearby.
```

```
EXTRACT FROM THE WIZARD OF FROBOZZ

Great Cavern
This is the centre of the great cavern.
A great room of flowing colour has been
carved out of the limestone. Stalactites
and stalagmites of many sizes are
everywhere. The room glows with dim
light provided by phosphorescent moss,
and weird shadows move all around you. A
narrow path winds among the stalagmites.
There are many little trails leading in
here and there, but a good one leads
southwest towards the edge of the room,
and another leads northeast.

A strange little man in a long cloak
appears suddenly in the room. He is
wearing a high pointed hat embroidered
with astrological signs. He has a long,
stringy, and unkempt beard.
The Wizard draws forth his wand and
waves it in your direction. It begins to
glow with a faint blue glow.
The Wizard, almost inaudibly, whispers a
word beginning with "F" and then
disappears, chuckling nastily.
Ooops! You dropped the lamp.

>GET THE LAMP AND GO NE

Taken
Foot Bridge
You are standing on a crude but sturdy
wooden foot bridge crossing a deep
ravine. The path runs north and south
from here.

>CLIMB DOWN THE BRIDGE

The drop would certainly be fatal.

>JUMP OFF BRIDGE
```

dinner? Can a solid-gold Egyptian coffin be carried up a narrow chimney? How does one remove the Elfin sword embedded in the rock? What will move the red dragon from his lair? What is the secret purpose of the Dungeon Master? There are many such mysteries to be fathomed in Zork.

THAT LITTLE TOUCH OF LUXURY

Apart fom being a fully realistic and complex, imaginative world of its own, Zork, has some other features to make playing it such a pleasure. A transcript of your commands and all responses can be obtained by the verb "Script". This causes all screen changes to be output to a printer, there by giving you the luxury of studying the text for further clues and insights – at your own leisure and away from the computer. Transcripts can be switched on and off at any time during a game. Mind you, Zork is merciful – it is not played out in real time so you can have as long as you like to make a decision or enter a comand.

Each time you enter a new location, it will describe in full detail. Thereafter, only the location title will be given, along with any objects in the room. This is "Brief" mode. "Superbrief" mode will give only the location title, whether you have previously visited it or not. "Verbose" mode (confirmed by Zork's equally pompous remark "Maximum Verbosity!"gives full details all the time. Any of the modes can be changed at any time.

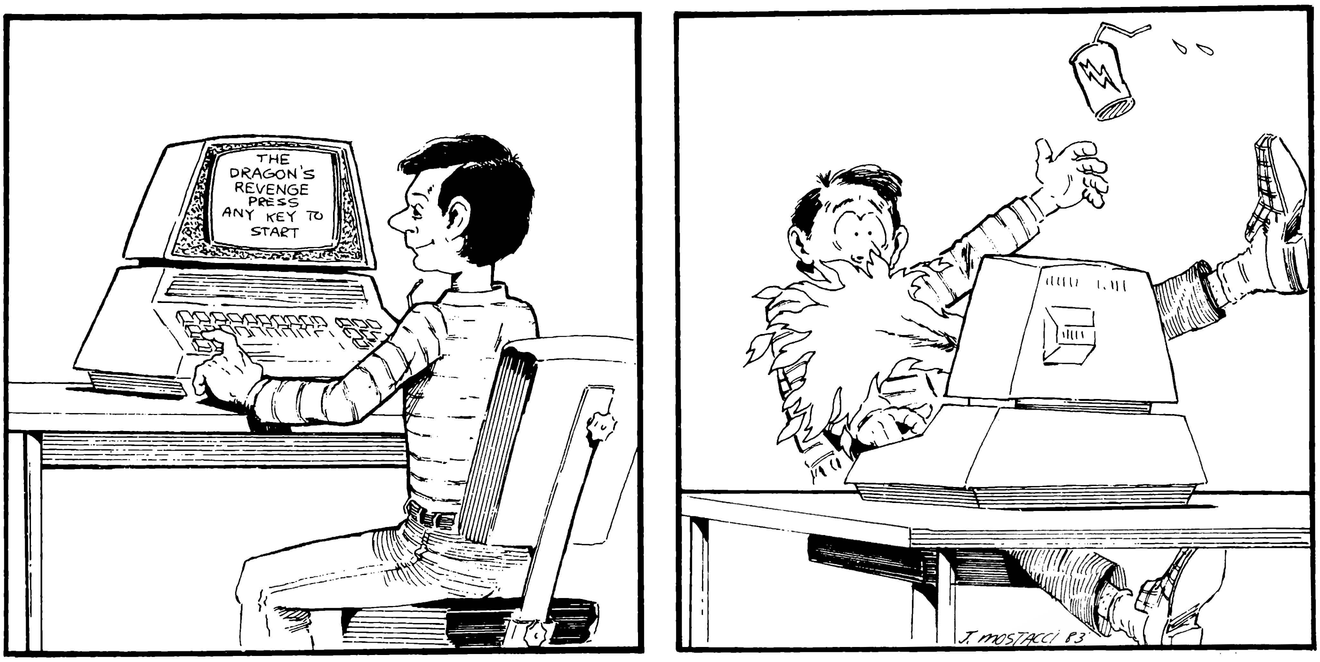
There is a "save" and "restore" game feature and, by Jiminnie, you certainly need it since completing one of these Adventures, is likely to take days, probably weeks.

Getting killed in Zork is not necessarily the end – you might be lucky enough to be brought back to life without restarting. However, you are likely to find yourself in a very strange location and will certainly have lost points. Speaking of points your tally is built up by fulfilling the required aspects of the mission, for gaining access to various objects and locations, and for remaining in one piece. Your score is translated at the end of a session (by typing "score" at any time) to a rating – reaching Grandmaster Adventurer having started as a Novice Adventurer is no mean feat.

One final good thing about Zork – if you do eventually reach the Grandmaster ranking, it's still a lot of fun to play again, trying out all the the things you didn't dare try before. Some of the results may surprise you.

I hope this goes a little way in convincing you that the Zork Adventures are very, very good. There is one sure-fire way to be converted to a Zork follower – just spend an hour playing any one of the trilogy. I guarantee you'll never be the same again. Zork reaches parts of a player's mind that other Adventures can't touch!

Micro Computer Printout
November 1983



Transactor: April 1983

VIC MUSIC

David Bergmeier was one of our ROMIK game winners in Vo. 3 No. 4.

This really surprised us as the quality of music goes far beyond our expectations of the VIC-20.

You'll need a 16K Expander.

David's program is of commercial quality. - (Ed.)

PROGRAM 1

```
10 REM SET UP MEMORY FOR HI RES DISPLAY
20 PRINT"▓▓▓▓▓▓INSTRUCTIONS"
30 PRINT"▓▓▓▓AFTER THIS PROGRAM HAS"
40 PRINT"RUN PLEASE TYPE LOAD   "
50 PRINT"AND PUSH 'RETURN' ."
60 PRINT"▓▓▓MAKE SURE THE 16 K RAM"
70 PRINT"IS INSERTED IN THE     "
80 PRINT"CARTRIDGE SLOT"
100 PRINT"▓▓▓▓  PUSH A KEY PLEASE.▓"
110 GETA$:IFA$=""THEN110
120 POKE36869,240
130 POKE36866,150
140 POKE0,108
150 POKE1,0
160 POKE2,192
170 POKE642,32
180 POKE648,30
190 SYS0
200 END
READY.
```

PROGRAM 2

```
10 REM SET UP HI RES CHARACTERS
15 GOSUB1000
20 FORI=0TO295
30 READJ:POKE7168+I,J
40 NEXT
50 POKE198,5
60 POKE631,78
70 POKE632,69
80 POKE633,87
90 POKE634,13
100 POKE635,131
110 END
200 DATA0,0,0,0,0,0,0,128
210 DATA0,0,56,56,16,16,125,69
220 DATA0,0,227,227,65,65,247,20
230 DATA0,0,128,128,1,2,196,78
240 DATA0,0,0,0,0,0,3,60
250 DATA1,3,5,9,17,97,129,1
260 DATA192,191,161,191,192,128,0,0
270 DATA0,255,64,255,2,4,9,9
280 DATA0,255,0,255,64,128,0,0
290 DATA0,255,0,255,64,128,0,0
300 DATA0,255,0,255,0,0,0,4
310 DATA125,255,0,255,69,69,69,69
320 DATA247,255,0,255,20,20,20,20
330 DATA223,255,0,255,64,64,64,66
340 DATA0,255,0,255,0,0,0,0
350 DATA0,255,8,231,18,9,4,4
360 DATA7,248,0,248,7,0,128,128
370 DATA192,0,0,0,192,60,3,0
380 DATA1,1,1,1,1,1,129,97
390 DATA18,18,18,9,9,4,2,1
400 DATA0,0,0,0,0,128,127,0
410 DATA10,17,10,4,7,8,243,20
420 DATA69,69,69,69,197,69,197,69
430 DATA20,20,20,20,20,20,20,20
440 DATA69,72,69,66,127,64,127,64
450 DATA0,128,0,0,252,2,255,2
460 DATA2,2,2,4,4,9,242,4
470 DATA64,64,64,128,128,0,0,0
480 DATA17,9,5,3,1,0,0,0
490 DATA255,0,0,0,0,0,0,0
500 DATA247,19,8,7,0,0,0,0
510 DATA197,197,69,197,69,69,69,125
520 DATA20,20,20,20,20,20,20,247
530 DATA127,127,64,127,64,64,64,192
540 DATA255,242,4,240,0,0,0,0
550 DATA248,0,0,0,0,0,0,0
560 DATA0,0,0,0,0,0,0,0,0,0,0
1000 PRINT"▓▓▓▓▓PRESS A KEY"
1010 POKE198,0:WAIT198,1:POKE198,0
1020 PRINT"▓":RETURN
READY.
```

PROGRAM 3

```
10 REM JESU,KING OF JOY AND GLADNESS
20 REM BY J.S. BACH
30 REM ARRANGED BY DAVID BERGMEIER
40 POKE36869,255:POKE36879,8
45 FORI=7680TO8185:POKEI,36:NEXT
50 PRINT"▒▒▒JESU,▒KING▒OF▒JOY▒AND"
60 PRINT"▒▒▒▒▒▒▒▒GLADNESS"
70 PRINT"▒▒▒▒▒▒▒▒BY▒J.S.▒BACH▒▒":PRINT"▒▒▒▒▒"
80 PRINTTAB(5)"@***ABC***DE"
90 PRINTTAB(5)"FGHJKLMNOPQR"
100 PRINTTAB(6)"STUVWXYZ[*\"
110 PRINTTAB(7)"]↑← !*#":POKE8000,34
120 FORI=1TO1000:NEXT
130 S1=36876:S2=S1-1:S3=S2-1
140 POKE36878,15
150 POKES1,201:POKES2,223:POKES3,235
160 FORI=1TO100:NEXT
170 POKES1,0:POKES2,0:POKES3,0
180 FORJ=1TO2:RESTORE
190 READL,M,H,D
200 IFL=-1THEN240
210 POKES1,H:POKES2,M:POKES3,L
220 FORI=1TOD*3:NEXT
230 POKES1,0:POKES2,0:POKES3,0:GOTO190
240 NEXT:GOTO250
250 READL,M,H,D
260 IFL=-1THEN2000
270 POKES1,H:POKES2,M:POKES3,L
280 FORI=1TOD*3:NEXT
290 POKES1,0:POKES2,0:POKES3,0:GOTO250
300 DATA0,0,215,50,0,0,219,50,235,228,223,50,0,0,228,50,0,0,225,50
310 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,5
0
320 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,207,215,50,0,0,219,50,0,201,223
,50
330 DATA237,231,225,50,0,0,228,50,0,0,231,50,239,235,228,50,0,0,225,50,0,0,223,5
0
340 DATA225,231,219,50,0,0,223,50,0,223,215,50,228,219,212,50,0,0,215,50,0,0,219
,50
350 DATA0,212,201,50,0,0,212,50,0,0,219,50,228,219,225,50,0,0,223,50,0,0,219,50
360 DATA235,228,223,50,0,0,215,50,0,0,219,50,231,215,223,50,0,0,228,50,0,0,225,5
0
370 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,5
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0
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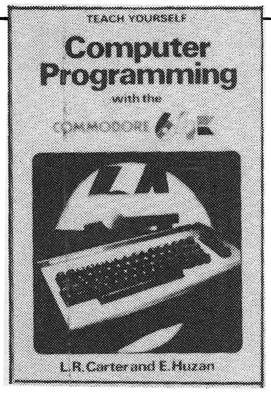

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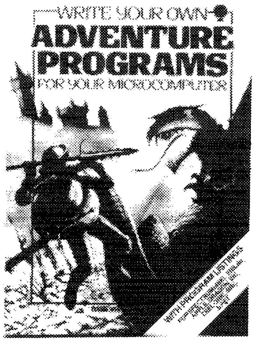

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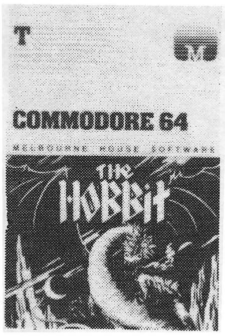

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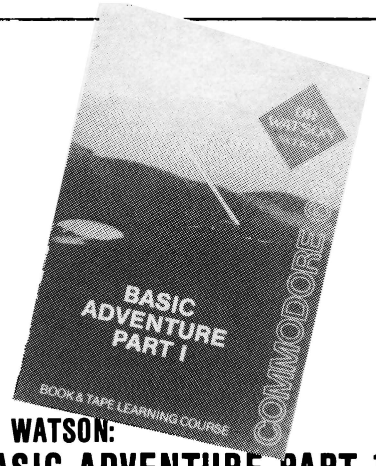

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ADVENTURE CLUB

An expanding computer club for Adventure devotees & other interested people. Starting with the Commodore 64 the club will gradually incorporate other micros (refer below).

Membership of the club entitles a person to a regular newsletter which will cover various aspects of programming and writing Adventures, senarios, book & program reviews, etc. Also each member will receive a membership card, authorative book on writing and playing adventures and a base (or current state) club adventure program on cassette (book and cassette to suit computers listed below). The program will span out wider as additional locations, perils, objectives and goals are added. Club members are encouraged to contribute program modules and story boards for these additions.

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0
400 DATA228,219,201,50,0,0,215,50,0,225,212,50,235,223,215,50,0,0,223,50,0,0,228
,50
410 DATA0,0,235,50,0,0,228,50,0,228,223,50,235,223,215,50,0,0,223,50,0,0,228,50
420 DATA235,228,223,200,234,0,0,200,231,225,225,200,234,228,228,200,231,215,0,20
0
430 DATA228,234,228,200,231,215,225,200,234,228,219,200,235,235,223,200,228,234,
201
440 DATA50,0,0,201,50,0,0,207,50,228,237,212,50
450 DATA0,0,219,50,0,0,215,50,228,212,219,50,0,0,225,50,228,215,223,50
460 DATA228,219,225,50,0,0,219,50,0,225,212,50,228,212,201,50,0,0,212,50,228,0,2
19,50
470 DATA228,219,225,50,0,0,223,50,234,228,219,50,235,228,223,50,0,0,215,50,0,0,2
19,50
480 DATA234,0,223,50,0,0,228,50,0,0,225,50,231,215,225,50,0,0,231,50,237,234,228
,50
490 DATA239,235,228,50,0,0,235,50,0,0,234,50,0,0,235,50,0,0,228,50
500 DATA0,234,223,50,231,223,215,50,0,0,219,50,0,0,223,50,225,219,207,50,0,0,228
,50
510 DATA0,0,225,50,228,0,223,50,0,0,219,50,0,231,215,50,228,225,201,50,0,0,215,5
0
520 DATA0,0,212,50,215,223,215,50
530 DATA-1,0,0,0
540 DATA0,0,215,50,0,0,219,50,235,228,223,50,0,0,228,50,0,0,225,50
550 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,5
0
560 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,207,215,50,0,0,219,50,0,201,223
,50
570 DATA237,231,225,50,0,0,228,50,0,0,231,50,239,235,228,50,0,0,225,50,0,0,223,5
0
580 DATA225,231,219,50,0,0,223,50,0,223,215,50,228,219,212,50,0,0,215,50,0,0,219
,50
590 DATA0,212,201,50,0,0,212,50,0,0,219,50,228,219,225,50,0,0,223,50,0,0,219,50
600 DATA235,228,223,50,0,0,215,50,0,0,219,50,231,215,223,50,0,0,228,50,0,0,225,5
0
610 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,5
0
620 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,223,215,50,0,0,219,50,0,0,223,5
0
630 DATA225,219,207,50,0,0,228,50,0,0,225,50,227,215,223,50,0,0,219,50,0,0,215,5
0
640 DATA228,219,201,50,0,0,215,50,0,225,212,50,235,223,215,50,0,0,223,50,0,0,228
,50
650 DATA0,0,235,50,0,0,228,50,0,228,223,50,235,223,215,50,0,0,223,50,231,215,227
,50
670 DATA228,219,228,50,0,0,201,50,0,0,207,50,225,0,212,50,0,0,219,50,0,0,217,50
680 DATA239,228,217,50,0,0,223,50,0,0,219,50,240,231,219,50,0,0,225,50,0,0,223,5
0
690 DATA0,219,225,50,0,0,219,50,0,0,207,50,232,219,195,50,0,0,201,50,0,0,207,50
700 DATA228,223,209,50,0,0,228,50,0,0,225,50,223,212,228,50,0,0,223,50,0,0,217,5
0
710 DATA231,223,207,50,0,0,212,50,0,228,217,50,237,225,219,50,0,0,225,50,0,0,223
,50
720 DATA232,219,225,50,0,0,231,50,0,217,228,50,237,232,228,50,0,0,232,50,0,0,231
,50
730 DATA240,237,231,50,0,0,237,50,0,0,236,50,232,225,237,50,0,0,231,50,0,0,225,5
0
740 DATA231,225,219,50,0,0,223,50,0,0,225,50,228,219,232,50,0,0,231,50,0,0,228,5
0
750 DATA229,219,225,50,0,0,223,50,0,0,219,50,231,223,207,50,0,0,219,50,0,228,217
,50
760 DATA237,225,219,50,0,0,225,50,0,0,231,50,219,0,237,100,0,0,0,50,239,228,215,
100
770 DATA240,231,215,50,0,0,225,50,0,0,228,50,237,237,231,50,0,0,235,50,0,0,232,5
0
780 DATA231,225,235,50,0,0,238,50,0,0,237,50,232,240,237,50,0,0,240,50,0,215,239
,50
790 DATA 0,219,240,50,0,0,237,50,0,0,232,50,235,223,228,50,0,0,231,50,0,228,232,
50
800 DATA225,215,231,50,0,0,235,50,0,0,232,50,225,235,235,50,0,0,231,50,0,0,225,5
0
810 DATA225,231,215,50,0,0,219,50,0,228,221,50,232,225,219,50,0,0,225,50,0,0,223
,50
820 DATA228,232,225,50,0,0,219,50,0,0,209,50,235,223,201,50,0,0,207,50,0,0,209,5
0
830 DATA225,215,207,50,0,0,195,50,0,0,201,50,225,225,207,50,0,0,215,50,225,228,2
12,50
840 DATA223,228,215,50,0,0,223,50,228,234,219,50,235,228,223,50
850 DATA0,0,215,50,0,0,219,50,235,228,223,50,0,0,228,50,0,0,225,50
860 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,5
0
870 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,207,215,50,0,0,219,50,0,201,223
,50
880 DATA237,231,225,50,0,0,228,50,0,0,231,50,239,235,228,50,0,0,225,50,0,0,223,5
0
890 DATA225,231,219,50,0,0,223,50,0,0,215,50,228,219,212,50,0,0,201,50,0,227,207
,50
900 DATA228,219,212,50,0,0,219,50,0,0,215,50,228,212,219,50,0,0,225,50,228,215,2
23,50
910 DATA228,219,225,50,0,0,219,50,0,225,212,50,228,212,201,50,0,0,212,50,228,0,2
19,50
920 DATA228,219,225,50,0,0,223,50,234,228,219,50,235,228,223,50,0,0,215,50,0,0,2
19,50
930 DATA234,0,223,50,0,0,228,50,0,0,225,50,231,215,225,50,0,0,231,50,237,234,228
,50
940 DATA239,235,228,50,0,0,235,50,0,0,234,50,0,0,235,50,0,0,228,50
950 DATA0,234,223,50,231,223,215,50,0,0,219,50,0,0,223,50;225,219,207,50,0,0,228
,50
960 DATA0,0,225,50,228,0,223,50,0,0,219,50,0,231,215,50,228,225,201,50,0,0,215,5
0
970 DATA0,0,212,50,215,223,215,50,0,0,223,50,0,0,228,50,0,0,235,50,0,0,228,50
980 DATA0,228,223,50,0,235,215,50,0,0,223,50,0,228,228,50,235,228,232,50,0,0,228
,50
990 DATA0,235,223,50,0,228,215,50,0,0,223,50,0,223,228,50,0,225,231,50,0,0,225,5
0
1000 DATA0,0,219,50,0,0,212,50,0,0,219,50,0,219,225,50,215,223,228,50,0,0,223,50
1010 DATA0,0,215,50,0,0,207,50,0,0,215,50,0,215,223,50,215,219,225,50,0,0,219,50
1020 DATA0,0,212,50,0,0,201,50,0,0,212,50,0,212,219,50,0,201,225,50,0,0,223,50
1030 DATA0,212,219,50,215,228,223,50
1040 DATA0,0,215,50,0,0,219;50,235,228,223,50,0,0,228,50,0,0,225,50
1050 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0,234,
50
1060 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,207,215,50,0,0,219,50,0,201,22
3,50
1070 DATA237,231,225,50,0,0,228,50,0,0,231,50,239,235,228,50,0,0,225,50,0,0,223,
50
1080 DATA225,231,219,50,0,0,223,50,0,223,215,50,228,219,212,50,0,0,215,50,0,0,21
9,50
1090 DATA0,212,201,50,0,0,212,50,0,0,219,50,228,219,225,50,0,0,223,50,0,0,219,50
1100 DATA235,228,223,50,0,0,215,50,0    219,50,231,215,223,50,0,0,228,50,0,0,225,
50
1110 DATA231,215,225,50,0,0,231,50,0,0,228,50,223,215,228,50,0,0,235,50,0,0;234,
50
1120 DATA231,223,235,50,0,0,228,50,0,0,223,50,231,223,215,50,0,0,219,50,0,0,223,
50
1130 DATA225,219,207,50,0,0,228,50,0,0,225,50,227,215,223,50,0,0,219,50,0,0,215,
50
1140 DATA228,219,201,50,0,0,215,50,0,225,212,50,235,223,215,200,-1,0,0,0
2000 PRINT"▒▒▒▖▖▌▌▌▌▌▌▌▌▌AGAIN?"
2010 GETA$:IFA$=""THEN2010
2020 IFA$="Y"THENRESTORE:GOTO10
2030 IFA$<>"N"THEN2010
2040 REM END
2060 POKE36869,240
2070 POKE36879,27
2080 PRINT"▒▓":END
READY.
```

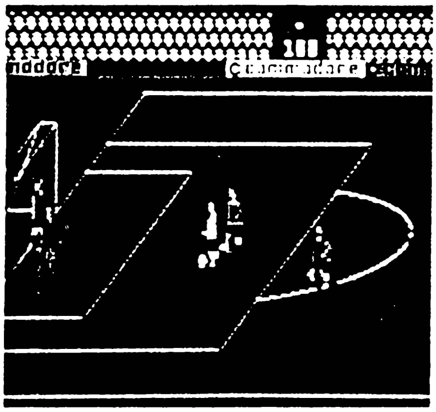
An Instructional Guide to World-Class International Soccer on Cartridge for the Commodore 64

By Steve Finkel

The red-shirted fans in the crowd stand and roar their approval. The red-clad players scramble back to their defensive zone after scoring a goal while the opposing blue team waits impassively at midfield for play to start. The score reads 1-0 as the clock continues to tick. The referee's whistle sounds as the blue team resumes play with possession of the ball and penetrates into the red defensive zone. Some good passing produces several shots on the red goal, as the goalkeeper dives to deflect each shot. Finally, he is unable to prevent a header from going in and the blue team has evened the score. This brings the blue-shirted fans to their feet.

This is a scenario from Commodore's new *International Soccer* game for the Commodore 64. It is by far the most realistic sports game available for the 64, demanding strategy and real skill to master. Yet even though it will challenge the best, it will still be fun for the less skilled player.

There are countless details in the game that make this an outstanding version of soccer, with strikingly accurate and exciting play quality. For instance, if you don't like the teams' color combination—blue against red—you can change both teams to another color. Depending on your own preference you can opt for yellow, orange, white, gray or even choose non-chroma black and white players.

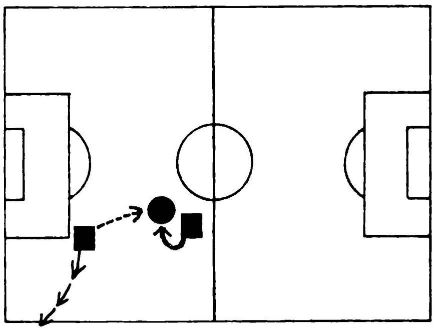


Soccer can be played with two players or against the computer. When playing the computer you can choose the skill level of your opposition from one to nine. A level nine computer team plays letter-perfect soccer, passing crisply, shooting accurately and playing tough defense. A level one opponent is eminently beatable and an adequate opponent for a young child.

After you select colors and opponent, the action starts. You directly control one player with your joystick at any given time. This player changes color from his teammates to be easily differentiated. For example a player on the blue team turns light blue, a player on the red team changes to pink, etc.

The player who is under direct control is determined by ball possession. The offensive player with the ball or nearest the ball will change color, so you know he is the one who can be directed by your joystick. Meanwhile, the other players on the team will run patterns in their appropriate zone, related to the movement of the ball. The defensive player closest to the ball also comes under joystick control if there are two players. The other defensive players then simply play their zone or pursue the ball. Only a portion of the field may be seen at one time, scrolling horizontally as the ball moves up and down the field.

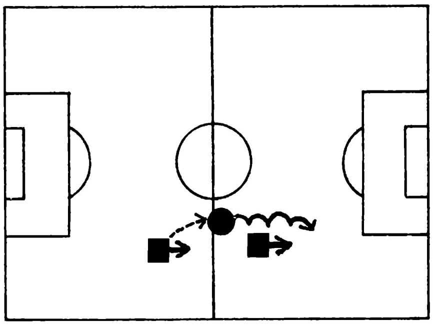
If a controlled player goes off the screen a player on screen will change color. This can be used to great advantage on both offense and defense. For example, you can use this principle on offense when passing to a man ahead of the ball carrier. After kicking the ball forward (by pressing the fire button) to make a pass you still control the player who kicked the ball and cannot control the receiver until the pass reaches its target. However, to gain an advantage, you can enable the receiver to go after the ball before the ball reaches him. Use the joystick to move the player making the pass off the screen, back toward his own goal. Once he is off the



Passing: Player making a pass downfield is under joystick control. To gain control of the receiver, run the passer off the screen immediately after making the pass.

screen, the player receiving the pass will come under joystick control and may retrieve the ball before defenders can get to him.

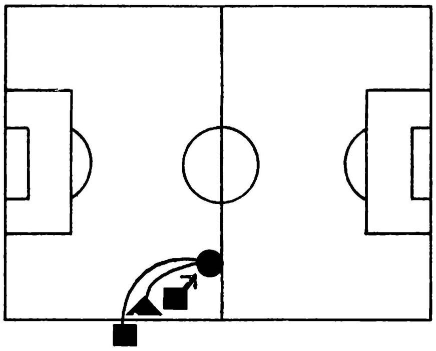
This same principle can be effectively applied to defense as well. If the man you're controlling is too far behind the player carrying the ball you can run him off the screen to gain control of a man in a better position in the defensive zone.



Heading the ball: Kicking the ball from directly behind a player may cause him to head the ball. A player can head the ball downfield if he continues in the direction he was going when he first headed the ball.

Players move at different speeds: a player dribbling the ball moves slower than a player without the ball. This makes a downfield passing attack very important. A good passing strategy is to guide the man controlling the ball downfield and have him kick the ball ahead just as a defensive man catches up to him.

Another way to move the ball downfield is by getting a player to "head" the ball. A player is able to bounce the ball on his head repeatedly, carrying it downfield. The advantage is that a player heading the ball moves at the same speed as a player running without the ball. To get a player to head a ball, you must pass directly at the player from a distance that puts the height of the ball around the receiver's head. The receiver will then bounce it in the air for a limited time as he proceeds downfield. As with passing skills, it is possible to become sophisticated in heading ability. It is also possible to pass the ball or score goals using this tactic.

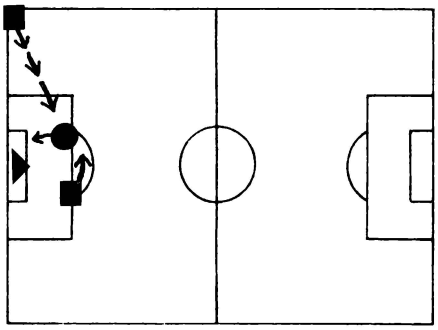


Inbound passing: The player receiving the throw should be about three to five strides from the sideline and move away from the passer.

Another aspect of the game you need to master is positioning and moving players on throw-ins and corner kicks. If one team kicks the ball out of bounds over the sideline, the other team gets a throw-in. These overhead passes can be difficult but can also lead to goals and attacks on goal if done well. (If done poorly, they can also lead to goals and attacks on goal —for the other team!) One factor that makes this play easier is the shadow of the ball, which is visible on the field when the ball is in the air. The shadow can be a great help in judging where the ball will land.

Positioning is also a key to inbounding well. The passer will usually overthrow the ball, so the player getting the throw-in should be positioned about 3-5 strides from the sideline and move away from the passer to receive the ball. It is also a good idea to try to keep a defensive man between the passer and the receiver. If you are receiving the in-bounds pass in a crowd it is sometimes a good play to press the fire button at the instant the ball reaches your player. If the positioning is right the player will kick or head the ball forward.

When defending against an inbounds pass it is best to stay behind the player receiving the pass since you have better position to get the ball. Another factor to keep in mind is defensive position. It is a good strategy to place your defensive player nearer your goal than the receiver is. If the receiver seems to be too far away from the passer, the defensive player can gamble and cut in front of the receiver to steal the pass.



Comer kick. offesive strategy: Position your receiver about one stride in front of the goallie. Then run a loop away from the goal and back toward the corner where the ball was kicked.

A team gets a comer kick when the opposing team is responsible for kicking the ball over their own end line. Comer kicks can be very difficult to defend against if well executed. There are several good strategies for effective comer kicks. The positioning of the player in front of the net is again important, as is his movement. He must "out position" the defensive man to get the ball, as well as place himself in goal-scoring position.

If an offensive player is properly manipulated it is possible to head or kick the ball into the net before the defense or goalie has a chance to react. One strategy that is usually effective is to position your player about one stride in front of the goalie. When the ball is kicked run a loop away from the goal.

article from: Commodore Power/play Winter 1983

STOCKMARKET SIMULATIONS

For the C64

article from: Commodore Power/play Vol. 2 No. 2 1983

ADVENTURE COMPETITION: We have 2 games to give away to the best adventure sent to me for the VIC or C64 before 1 st May.

Prizes: Thermonuclearwars (for VIC) from Video Classics
Cops and Robbers (for C64) from Ozisoft
Conditions: Maximum of one game per winner. All entries to be on cassette or disk (will be returned if postage included) Editors decision is final and no correspondence will be entered into. Editor reserves the right to publish all entries.
Send to: Mervyn Beamish Graphics Pty Ltd
82 Alexander St. Crows Nest 2065 NSW

How can you have a computerized business special without a stock market simulation? You can't. So here's my version of the popular simulation. You get $5000 and 52 weeks to make your millions playing the stock market. I have set out to change the one most annoying feature of the simulations that I've seen. The amount that each stock changed in price and the direction of that change is always randomly generated. Now how can they call that a simulation? If the stock market actually changed randomly, it would be like a big lottery with people taking random chances on random changes. In real life there are economic principles which guide the changes of the various stocks. I have incorporated just a little of that into this program to allow a more realistic simulation.

There are five companies competing in this program with shares of each selling for $50 at the beginning of the program. The relationships between the companies and the price of their stock is relatively simple. There are two oil companies; when one goes up the other goes down (makes sense). There are two car companies; when the oil shares go up the car shares go down (who wants to buy a new car when gasoline is $1.50 a gallon?). The last company is a bike manufacturer; when the net change of oil and car shares is up, the bike shares go down (the more that people are driving, the less they are biking).

To create these interdependencies, I used a random seeding method. This means that the first change and direction (for oil company 1) is randomly generated and this is used as a seed for the change of the second oil company. The sum of the first two changes is used as a seed for the total of the second two changes (the car companies). Then the sum of the first four changes is used as a seed for the last change (the bike manufacturer). One of the interesting side effects of using this method is that the size and randomness of the changes decrease through the five stocks. If you want to take a chance on the "big score" put all your money on the first stock. You've got even odds on making a lot or losing a lot. If you want to be more of a conservative, put your money on the last stock. Your money is relatively stable here. Don't count on making a killing, but if you lose some money it won't be much. Play the field any way you want and see how good your market instincts are.

Subroutines perform each of the major calculations, inputs, and displays of the program. There are subroutines to display each of the three program screens: Stock Market Screen at 400, Portfolio Screen at 721 and Broker's Window at 800. The main calculation subroutine is in lines 8 through 170. This subroutine calculates the weekly changes for each of the stocks. Line 195 performs some housekeeping by jumping to subroutines that round off numbers to the correct number of decimal places, check for high and low values of each stock and update the current value of any previously purchased shares. Lines 900 to 960 are the subroutine for buying and selling stocks. The subroutine beginning at 200 ends the program after 52 weeks.

The following list shows all of the variables in the program with their uses. The subscripted variables each have five subscripts, one for each company.

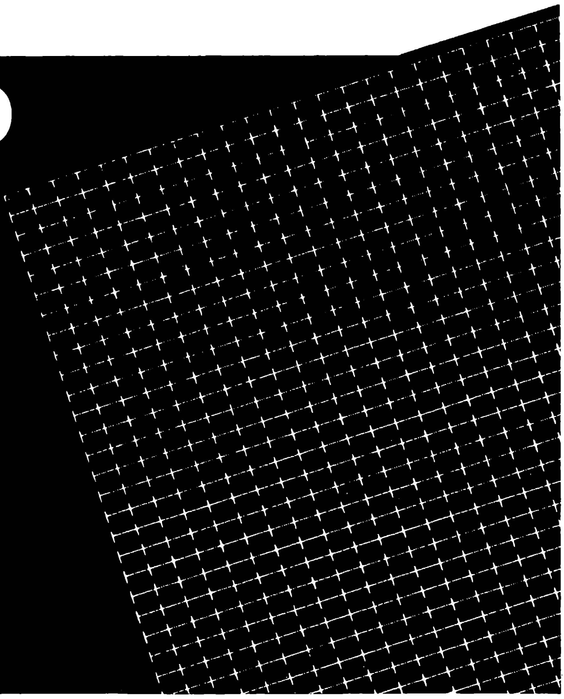
N$( ) = Names of companies
A$ ( ) = Abbreviated names of companies
ST ( ) = Current price of stock
L ( ) = Lowest price of stock
H ( ) = Highest price of stock
N ( ) = Number of shares owned
P ( ) = Purchased value of shares
C ( ) = Current value of shares
CS = Cash on hand
TT = Total assets
W = Week number
D1-D5 = Weekly change of each stock
DT = Sum of D1 and D2
BC = Background color
N$,Z$,A$,R$,B$,A,B,X = Input statement and miscellaneous variables

STOCKMARKET SIMULATIONS

```
1 REM ***STOCK MARKET SIMULATION***
2 REM ***WRITTEN BY  JIM GRACELY***
3 N$(1)="OLIV OIL":N$(2)="BODY OIL":N$(3)="ODOM MOTORS":N$
  (4)="MILLI MOTORS"
4 N$(5)="FRAM BIKES":A$(1)="O. OIL":A$(2)="B. OIL"
  :A$(3)="O. MOTORS"
5 A$(4)="M. MOTORS":A$(5)="F. BIKES"
6 FOR X=1 TO 5:ST(X)=50:L(X)=50:H(X)=50:NEXT:W=0
  :CS=5000:BC=53281:POKE BC-1,0
7 GOTO 704
8 REM ***CALCULATIONS***
9 REM ***FIRST TWO***
10 D1=RND(1)*10
20 D1=INT(D1*10)/10
30 S=SGN((RND(1)*6)-3)
40 D1=D1*S
50 ST(1)=ST(1)+D1
55 IF ST(1)<0 THEN ST(1)=ST(1)-D1
60 D2=-(INT(D1*RND(1)*10)/10)
70 ST(2)=ST(2)+D2
75 IF ST(2)<0 THEN ST(2)=ST(2)-D2
80 REM ***SECOND TWO***
90 DT=D1+D2
100 D3=-DT/(RND(1)+.50)
120 D3=INT(D3*10)/10
130 D4=INT(RND(1)*D3*10)/10
140 ST(3)=ST(3)+D4
145 IF ST(3)<0 THEN ST(3)=ST(3)-D4
150 ST(4)=ST(4)+(D3-D4)
155 IF ST(4)<0 THEN ST(4)=ST(4)-(D3+D4)
157 REM ***LAST ONE***
160 D5=INT((DT+D3)*RND(1)*20)/10
165 ST(5)=ST(5)+D5
170 IF ST(5)<0 THEN ST(5)=ST(5)-D5
195 GOSUB 510:GOSUB 310:GOSUB 610:GOSUB 405
199 IF W<52 THEN W=W+1:RETURN
200 REM ***ENDING***
210 PRINT"[DOWN]AFTER 52 WEEKS (1 YEAR) THIS IS HOW THE"
220 PRINT"STOCKMARKET STANDS[DOWN3]"
230 PRINT"PRESS THE SPACE BAR TO SEE"
235 PRINT"YOUR FINAL TOTALS"
240 GET Z$:IF Z$=""THEN 240
250 IF Z$<>" "THEN 240
260 F=1:GOSUB 722
265 TT=INT(((TT+CS)-5000)*100)/100
270 IF TT>=0 THEN T$="MADE"
280 IF TT<0 THEN TT=-TT:T$="LOST"
290 PRINT"[DOWN2]HOPE YOU HAD FUN!"
```

```
295 PRINT"YOU "T$" $"TT" !!"
297 GET A$:IF A$=""THEN 297
298 POKE BC-1,14:POKE BC,6:PRINT CHR$(154)CHR$(147):END
300 REM ***LOWEST/HIGHEST CHECK***
310 FOR X=1 TO 5
320 IF ST(X)<L(X)THEN L(X)=ST(X)
330 IF ST(X)>H(X)THEN H(X)=ST(X)
340 NEXT:RETURN
400 REM ***STOCK MARKET SCREEN***
405 POKE BC,12:PRINT CHR$(5)
410 PRINT"[CLEAR,RVS,SPACE9]***STOCK MARKET***             ";
412 FOR X=1 TO 40:PRINT"[RVS]-[RVOFF]";:NEXT
413 PRINT"[RVS]WEEK-->[RVOFF]"W
415 PRINT"[DOWN2,RVS]STOCK[RVOFF]"," [RVS]LOW[RVOFF]
    ","[RVS]HIGH[RVOFF]","[RVS]PRESENT[RVOFF]"
420 FOR X=1 TO 5
430 PRINT"[DOWN]"A$(X),L(X),H(X),ST(X)
440 NEXT:RETURN
500 REM ***CONTROL DECIMAL PORTION***
510 FOR X=1 TO 5
520 ST(X)=INT(ST(X)*10)/10
530 P(X)=INT(P(X)*100)/100
540 NEXT:RETURN
600 REM ***UPDATE CURRENT VALUE***
610 FOR X=1 TO 5
620 C(X)=ST(X)*N(X)
630 NEXT:RETURN
700 REM ***START OF MAIN ROUTINE***
704 GOSUB 10:R$=""
705 PRINT"[DOWN2]DO YOU WANT TO VIEW YOUR PORTFOLIO (Y/N)":INPUT R$
710 IF LEFT$(R$,1)="N"THEN 704
720 IF LEFT$(R$,1)<>"Y"THEN PRINT"[UP5]";:GOTO 705
721 REM ***PORTFOLIO SCREEN***
722 POKE BC,14:PRINT CHR$(31)
725 PRINT"[CLEAR,RVS,SPACE13]PORTFOLIO               ";
726 FOR X=1 TO 40:PRINT"[RVS]+[RVOFF]";:NEXT
730 PRINT"[DOWN3,RVS]STOCK[RVOFF]","[RVS]SHARES[RVOFF]","
    [RVS]PURCH[RVOFF]","[RVS]CURRENT[RVOFF]"
735 PRINT,,"[RVS]VALUE[RVOFF]","[RVS]VALUE[RVOFF]"
740 TT=0:PRINT"[DOWN]":FOR X=1 TO 5
750 PRINT A$(X),N(X),P(X),C(X)
755 TT=TT+C(X)
760 NEXT
770 PRINT"[DOWN]CASH $",,,CS
775 FOR X=1 TO 38:PRINT"@";:NEXT
780 PRINT:PRINT"TOTAL $",,,TT+CS
785 IF F=1 THEN RETURN
```

PET SCREEN GRID



This is a short routine that will produce a 40 x 25 grid to aid in the setting out of screen layout.

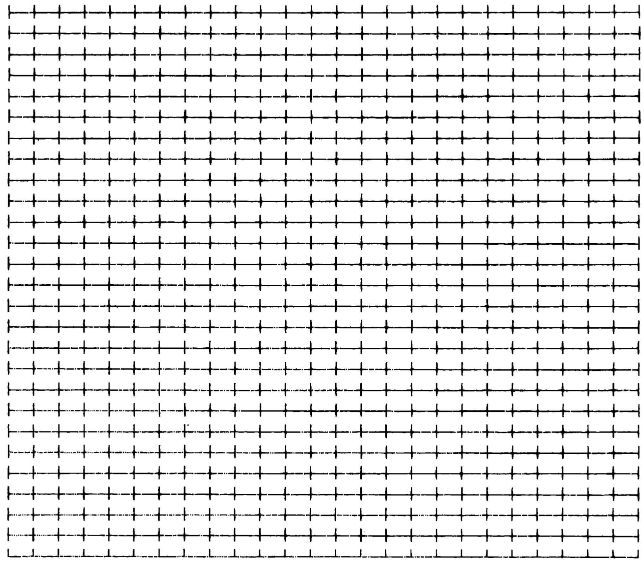
By using the grid sheet you can see how instructions will look on the screen and then decide whether to use TAB or cursor rights and how many cursor downs to include in the programme without the usual trial and error.

To increase the number of copies adjust lines 180-190, and to move the grid further up or down the sheet change the value in line 290.

The programme was written on a CBM4016 and printed with a 4022P printer.

by Peter Bungay

```
 100 REM ...PET SCREEN GRID...
 110 REM ...PETER BUNGAY 13 NOV 83...
 120 PRINT"█"
 130 PRINTTAB(11)"* █PET SCREEN GRID█ *"
 140 PRINT"███THIS PROGRAMME WILL PRINT A 40 X 25"
 150 PRINT"███GRID THAT WILL AID IN SETTING UP YOUR"
 160 PRINT"███SCREEN OUTPUT."
 170 INPUT"███HOW MANY COPIES REQUIRED";C
 180 IFC<=5THEN220
 190 IFC>5THENPRINT"████ARE YOU SURE? PAPER IS SCARCE!"
 200 PRINT"███KEEP IT LESS THAN 5"
 210 INPUT"███HOW ABOUT CHANGING IT";C
 220 PRINT"███████CONTINUE - █Y█ OR █N█"
 230 GETC$:IFC$<>"Y"ANDC$<>"N"THEN230
 240 IFC$="Y"THEN260
 250 IFC$="N"THENPRINT"█":END
 260 OPEN1,4
 270 FORT=1TOC
 280 PRINT#1,CHR$(147)
 290 FORP=1TO8:PRINT#1:NEXTP
 300 PRINT#1
 310 PRINT#1,TAB(10)"┌";:FORA=1TO24:
       PRINT#1,"─";:PRINT#1,"┬";:NEXTA
 320 PRINT#1,"─";:PRINT#1,"┐"
 330 PRINT
 340 FORB=1TO39
 350 PRINT#1,TAB(10)"├";
 360 FORC=1TO24:PRINT#1,"─";:
       PRINT#1,"┼";:NEXTC
 370 PRINT#1,"─";:PRINT#1,"┤"
 380 NEXTB
 390 PRINT#1,TAB(10)"└";:FORD=1TO24:
       PRINT#1,"─";:PRINT#1,"┴";:NEXTD
 400 PRINT#1,"─";:PRINT#1,"┘"
 410 PRINT#1,CHR$(19)
 420 NEXTT
 430 CLOSE1
READY.
```



BASIC BACKGROUND - PT. 1

PUTTING UP WITH INPUT

Paul Blair

Paul Blair is very active in the Canberra Users Group. He has had items published in overseas journals a is about to publish his first book – A Machine Language Tutorial for the Commodore 64. Paul is one of those rare computer enthusiasts who can talk to beginners on there own level without being patronising. We are very pleased that Paul has offered us this four part series on the background workings of BASIC.

One of the nice features of microcomputers is the ability to communicate with them while a program is running. That may be taken for granted these days, but it wasn't always so....

BASIC provides modest methods of communication – the principal keyword and associated function is INPUT. Therein lies the rub, because the INPUT routine is very limited (to say the least!!!) After a while, using the INPUT seems inadequate, and we all cast around for something better – at least something that allows some control or editing of the characters as they come in from the keyboard. Thoughts, like a young man's fancy, turn to GET.

GET

GET is character oriented, unlike INPUT which is string or variable. By using GET each character can be taken in, examined and accepted or rejected as required. Moreover, as characters are handled, other controls can be applied. You may not be prepared to accept less than for characters for a name. INPUT can't check the length until the correct response is made. But the GET routine is more flexible.

The use of GET has to be combined with string concatenation to make up a system. Put simply, each input is tested and, if acceptable, added to any previous characters by 'adding' string characters. Enough words. Lets show how GET can work by demonstrating a subroutine.

In this Listing, CL means Cursor Left, + means CHR$(161) – to reject characters between 'Z' and shifted space.

Let's go through the listing. Prior to GOSUB entry the maximum length you will accept is as L1. line 3000 sets the capture string, P$, to a null. Line 3002 print a prompt bar (*'s here, but choose your own character). Line 3004 prints an equal number of cursor lefts to put the cursor back at the start of the prompt bar.

Character capture begins at line 3006, using a conventional GET loop that waits for a key to be pressed before moving on. Line 3008 looks for a minimum length (optional) – if the key is a RETURN and the line is below the preset minimum (L2) then the key is rejected and the program loops around. Otherwise, line 3010 accepts the return and exits the subroutine.

Line 3012 looks for a back arrow, which is used to delate one character. If found, one character is erased and the prompt '*' reinstated on the prompt bar. If not, the INST/DEL key is checked in line 3014 for total line erase, and restart the process.

```
3000  P$=""                                  :REM SET STRING TO NULL
3002  FOR Q=1 TO L1 :PRINT"*"; :NEXT         :REM PRINT L1 STARS
3004  FOR Q=1 To L1 :PRINT"CL"; :NEXT        :REM GO TO START OF LINE
3006  GET A$ :IF A="" THEN 3006              :REM NOTHING PRESSED
3008  IF A$=CHR$(13) AND LEN(P$)<L2 THEN 3006
3010  IF A$=CHR$(13) THEN PRINT A$ :RETURN
3012  IF A$="LEFT ARROW" THEN 3020           :REM BACKSPACE
3014  IF A$<>CHR$(20) THEN 3026              :REM DELETE ALL
3016  IF P$="" THEN 3000                     :REM REPAINT LINE
3018  FOR Q=1 TO LEN(P$) :PRINT"CL"; :NEXT :GOTO 3000
3020  IF P$="" THEN 3006                     :REM ERASE OLD INPUT
3022  IF LEN(P$)=1 THEN P$='" THEN :GOTO 3018
3024  P$=LEFT$(P$,LEN(P$)-1) :PRINT"CL CL"; :GOTO 3006
3026  IF A$<" " OR (A$>"Z" AND A$<"+") THEN 3006
3028  IF L1=1 THEN P$=A$ :PRINT CHR$(13); :RETURN
3030  IF LEN(P$)=L1 THEN PRINT CHR$(13); :RETURN
3032  P$=P$+A$ :PRINT A$; :GOTO 3006         :REM ADD CHAR
```

Lines 3016 to 3024 handle the sordid business of stepping back along the bar, and the lines are self explanatory. Aren't they?

Line 3026 checks for valid characters, A-Z and 0-9. Adjust this to suit yourself yourself if you have wider needs.

If the input requires only one character (say, Y/N type inputs) then L1 is preset to one and line 3028 takes care of it. then again, you may have set L1 higher. If the most recent character would have the output 'L1 + 1' long, then exit is automatic at line 3030. A RETURN has the same effect.

Last, but not least, the validate GET command is concatenated to any previous characters at line 3032, it's printed, and we look for more.

CHECKS

Perhaps that all sounds a bit complicated, but it's quite effective for a BASIC routine. You can build all sorts of checks for all sorts of tasks – eg you could change line 3026 to accept only numerals or only alphabetics. Instead of RETURNing directly, why not add some beeps and buzzes to help the user 'see' what key has been pressed without looking. I like to use CHR$(164) (the 'grid') for my prompt bar, but the underline (CHR$(164)) is also effective. I find the prompt bar useful for all sorts of reasons, not the least being that I make less mistakes with it there. Don't forget that the colour can be used to great effect.

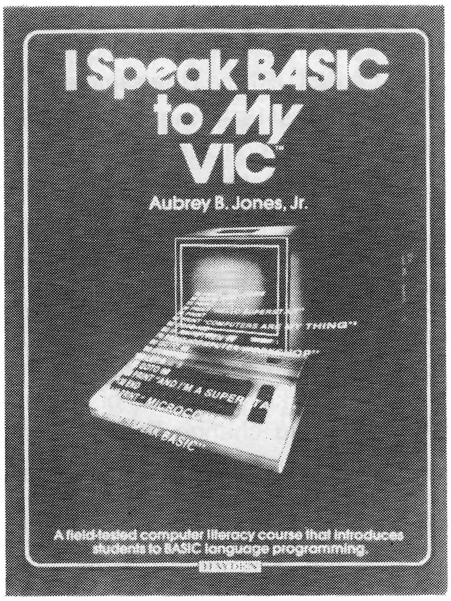
This routine is certainly not original – I'm only providing explanations! There are other comparable routines – CURSOR! programs (the magazine on a tape) use a similar but different routine that works along these lines. Parentage is not important, the object is convenience. Have fun, let me know what you come up with.

BOOK REVIEWS

I SPEAK BASIC TO MY VIC

Book review by Barrie Wayne

Now this is a fine manual for persons who have just acquired the VIC-20 friendly computer. It is the best value for beginners yet available. Why is this one so different? Well, lets start from the beginning. The first impact is the clear large text in this oversized book (21 X 28cms big) and has a text book feeling about it, almost as though you are enrolled in a computing course. The impression I received from this one is how simple it is all explained with the step-by-step format it uses.


I Speak BASIC to My VIC
Aubrey B. Jones, Jr.
A field-tested computer literacy course that introduces students to BASIC language programming.
HAYDEN

THE CONTENTS

Part 1 – Examines objectives, showing typical data processing examining parts of a computer.

Part 2 – The software, objectives, how to use computers, showing an example of a BASIC program, looking at the keyboard.

Part 3 – Starts with the writing of a pogram, executing and expanding, listing, ending.

Part 4 – Taking a look at mathematical operations, programming math operations, with example program.

Part 5 – Examines scientific notation, review and feedback.

Part 6 – Looks at relational operators, and IF-THEN/GOTO statments in this section.

Part 7 – Examines the input statements, string variables etc.

Part 8 – Uses the calculator mode and sizing memory, looking at definitions, how much memory is available.

Part 9 – Looks at the use of the cassette recorder, how to get the best from it, loading, saving with practice.

Part 10 – Using FOR – NEXT – STEP Statements, this section examines these commands and their purpose.

Part 11 – Here you will learn about reading DATA, how to incorporate these commands in the writing of programs.

Part 12 – Video display graphics, becoming familiar with VIC's graphic display, understanding SPC(N) & TAB(N) outputs, and with these to include them in a program.

Part 13 – Arrays, the explanation, examing different possibilities, dim statements, and developing, entering and running programs using numeric arrays.

Part 14 – Explaining the use of INT(X), ABS(X), and RND(X), the use of RANDOM, and to write programs with these new functions.

Part 15 – Subroutines, with an explanation, using terms like ON, GOTO, GOSUB, RETURN ON GOSUB, and using these in your programs. At the end of the book it also supplies pages of extra practices.

SUMMARY

This book is a fine example using a well set out and clearly defined text. It deals with this subject in a straight forward manner and simple manner. It is written with the student in mind, a comprehensive course on VIC BASIC for you, you are enrolled immeadiately you purchase this book.

This book has quite a few good points:

1. Clear text;
2. Large print;
3. At the end of each section it is well summarised with examples to practice on.
4. It treats the reader gently and leads you through the wonderous world of the VIC-20.

FINAL WORDS

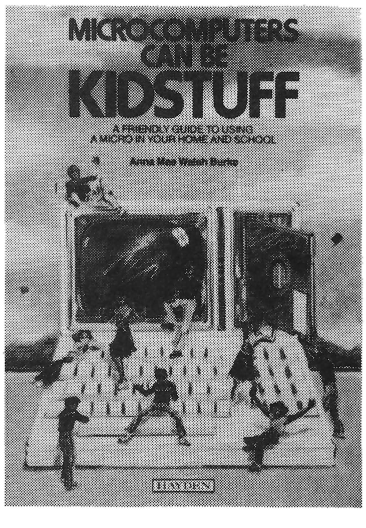
In the endless trekking from Computer bookshop to bookshop you begin to recognise the type of manual is available, this one is different, it is better, it is recommended for the beginner, the person who has just acquired a VIC-20 and would be a proud addition to your library.

TITLE:	I Speak BASIC to My VIC
PRICE:	$17.95
AUTHOR:	Aubrey B. Jones, Jr.
PUBLISHERS:	Hayden Book Company
SAMPLE FROM	Holt-Saunders Pty Limited 9 Waltham St, Artarmon NSW Phone (02) 439 3633

MICROCOMPUTERS CAN BE KIDSTUFF

A review by Marilyn Prescott

Microcomputers can be kidstuff: a friendly guide to using a micro in your home and school.


MICROCOMPUTERS CAN BE KIDSTUFF
A FRIENDLY GUIDE TO USING A MICRO IN YOUR HOME AND SCHOOL
Anna Mae Walsh Burke
HAYDEN

Clear, consise computer books for children are not easy to come by. This one avoids the cliches of cartoons and treats the subject seriously. It is a little difficult to decide who the anticipated audience is – the language is a little patronising for lower high school and too complex for upper primary.

The book covers enough history to explain where the computer state of the art is, describes some of the micros available on the U.S. market, flowcharting, essentials of programming and has sample programs. Definitions are clear and consise and the examples are not specifically for the U.S. markey. One of the most useful sections is the 'DICTONARY OF COMPUTERESE' – a glossary of computer terms at the back of the book.

This book would be of as much use to the non-computer learning student to get an understanding of what makes up a micro and as would be to the new computer student who is looking for how to do it samples.

TITLE:	Microcomputers can be Kidstuff
AUTHOR:	Anna Mae Walsh Burke
PUBLISHER:	Hayden Book Company
SAMPLE FROM	Holt-Saunders Pty Limited 9 Waltham St, Artarmon NSW Phone (02) 439 3633

DR. WATSON - BASIC ADVENTURE PART 1

reviewed by Mervyn Beamish

This is a tape/book combination for the Commodore 64. A combination that the DR WATSON series is well known for. The package is aimed at the seven to eleven age group and seems to be quite well for that age group.

The book is meant and designed to be read from, rather than read to, by the budding programmer.

I gave the package to Kim and Craig, (Yes my sons and chief testors for a lot of these items.) and watched their reaction.

The immediately gained empathy with the three main characters who are stranded on a spaceship and need to find out how to operate a C64 to fly the ship home. The characters are: a dotty old professor, a 200 year old beautiful princess and a robot that obviously escaped from the set of a popular space opera.

The boys were soon at the computer and getting stuck into it. However, there came a sudden lack of interest and the project stopped.

Why? It was to do with the typesetting and layout of the book.

When the characters were discussing the program they had just come across, it was not clearly indicated what were to be entered into the computer program and what were just discussion points so things got a bit mixed up and the programs didn't work. An adult would have immeadiately seen the diffence but the kids got mixed up.

Once that was corrected we worked our way through the book.

My general conclusion was that it is definitely a fun way of learning for the kids, it makes them think about the logic on computing and catches their imagination. A very nice book/tape combination.

TITLE:	Dr. Watson - BASIC Adventure Part 1
PRICE:	$29.95
PUBLISHER:	Glentop Publishers
SAMPLE FROM	The VIC Centre 416 Logan Rd., QLD. Phone (07) 397 0888

STIMULATING SIMULATIONS

reviewed by Mervyn Beamish

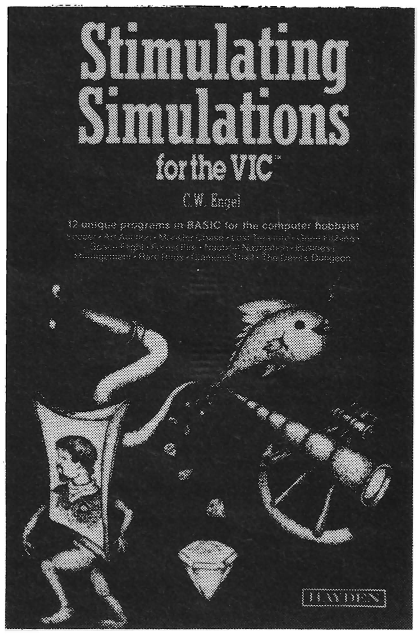
A VIC games book with a difference, I do believe that there is not one space invader look-alike in the '12 unique BASIC programs' included.

To quote the Introduction '......This book is designed for the person who is beyond the simple number-game of software development and would like to develop some interesting simulations. It is assumed that the reader is familiar with most of the BASIC commands and has written some simple programs.

Most of the programs in this book are written so that the computer does not do all of the 'thinking' but forces the player to develop some strategies for achieving the objectives.'

The book is not produced all that well, the front doesn't jump out and grab you, the print is reduced typewriter but clear and readable. But it has some very nice features.

There are flowcharts for every program with suggested modifications complete with line numbers. Where needed clear diagrams and sample runs are given so you can see what is meant to happen.



The programs include simulated
ART AUCTION,
FISHING AND NAVIGATION,
BUSINESS MANAGEMENT and others. An introductory chapter demonstates and discusses design and methods of writing simulation games.

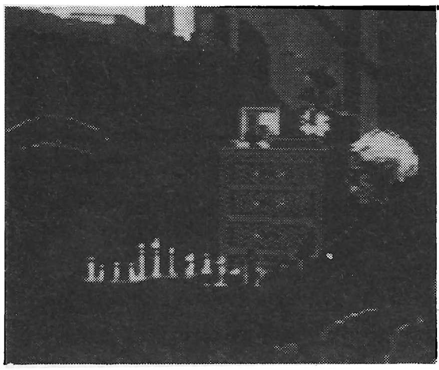
This is a good starter for the simulation game writing and is a handy reference to simple techniques for the more experienced. Entirely in BASIC this is a good buy.

TITLE:	Stimulating Simulations for the VIC
PRICE:	$10.50
AUTHOR:	C.W. Engel
PUBLISHER:	Hayden Book Company
SAMPLE FROM	Holt-Saunders Pty Limited 9 Waltham St Artarmon NSW Phone (02) 439 3633

Continued on page 36

PAINTPIC™

SUPER ART FOR THE COMMODORE 64



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PAINTPIC requires no joystick, printer, or anything special beyond basic computer, tape-drive and color TV. Joystick can be used. Can run from disk.
The Manual is easy-to-read and has complete step-by-step instructions designed to quickly teach the new user how to draw pictures. It has been tested with both teenagers and professional artists. The manual also contains picture load and display program.
PAINTPIC incorporates a start-up attractor picture of the Rose, which automatically cycles through the sixteen Commodore colors.

MODES: pen, brush, text.
CURVED SHAPES: arc, circle, ellipse.
STRAIGHT SHAPES: box, line, triangle, parallelogram.
FILL: pen, or brush
SETTABLE COLOR: pen, bristles, brushmoves, four dot-colors, crosshair, border, background.
MOVES: horizontal, vertical, diagonal, by dot, brush width, character.
POINT MOVES: to start, end, midpoint, next home, perspective.
BLOCK MOVES: copy, rotate 90°, halve or double across or down, mirror across and down
SELECT FEATURES: file save/get picture or block to tape/disk; mix shapes, text, all graphics characters; eight storable brushes; select brush width; tilted shapes; perspective point and line; mark start, end, perspective point; Help Menus.

PaintPic

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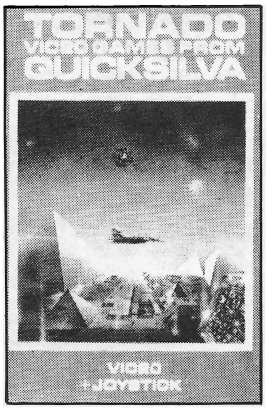

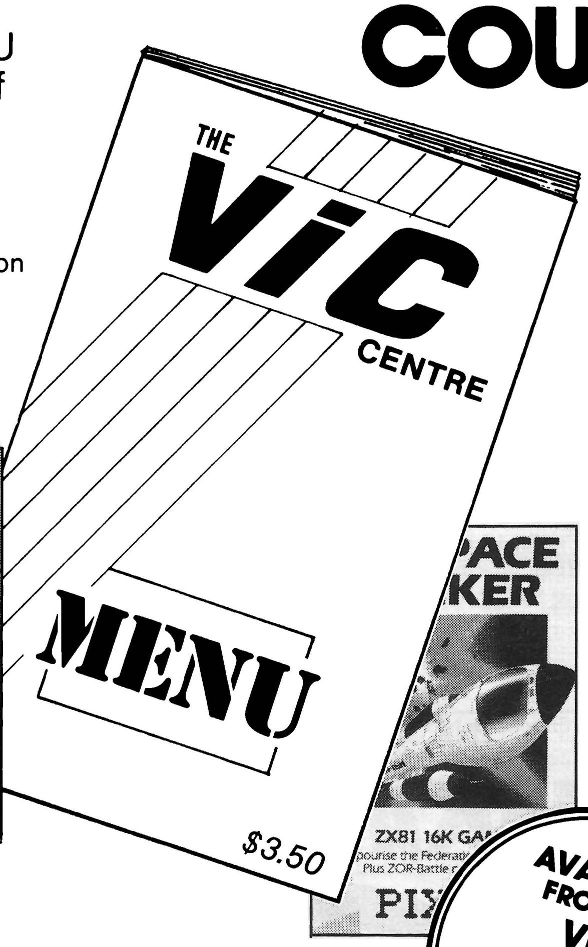

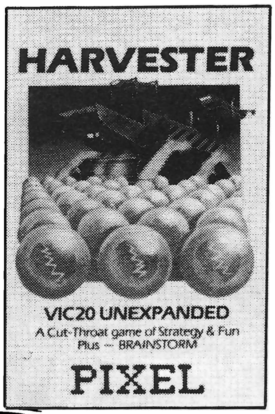

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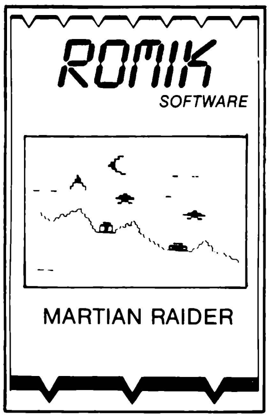

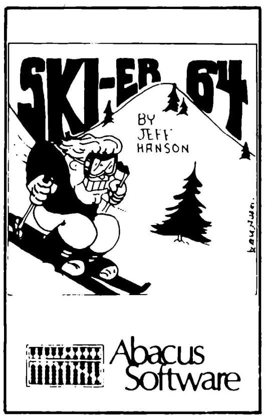

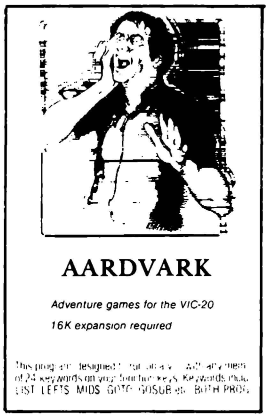

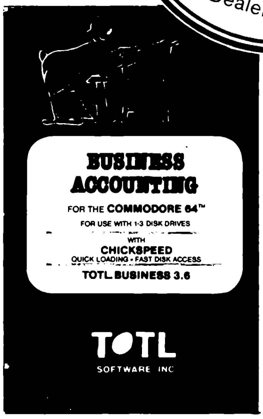

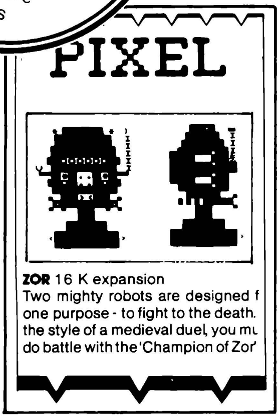

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PART 3

The Commodore 64 Piano

Finally, you're ready to make some music with the Sound Interface Device (SID) in your Commodore 64! (This will undoubtedly be a great relief to those who have been following this series from the start.) Beginners may simply want to type in the program listing, following Paul's instructions to turn their 64 into a piano keyboard that produces a real piano sound. However, the more intrepid among you can go through Paul's line-by-line explanation—you'll learn a great deal, regardless of your computer experience, if you do. (Parts 1 and 2 appeared in the Winter, 1982 and Spring, 1983, issues of *Power/Play.)*

Yes, folks, it's that time again. Hopefully by now you've begun to see the various interactions among envelopes, frequencies and waveforms. These are our basic tools for music (or, indeed, any sound) synthesis on the Commodore 64.

To recap, the program in our last installment calculated a frequency array for seven octaves of notes. We will use that program as a base for this article, as we create a program that will allow us to play the keyboard like a piano. If you missed that issue, you'll find the original program on page 45.

Before we begin adding lines to the program, you will need to delete all the lines from 450 onward (simply enter the line numbers by themselves and press RETURN). If you remember, these lines let us hear the frequency table being created each time we ran the program, and we certainly don't want that to happen now.

by Paul Higginbottom

MAKING FRIENDS WITH SI

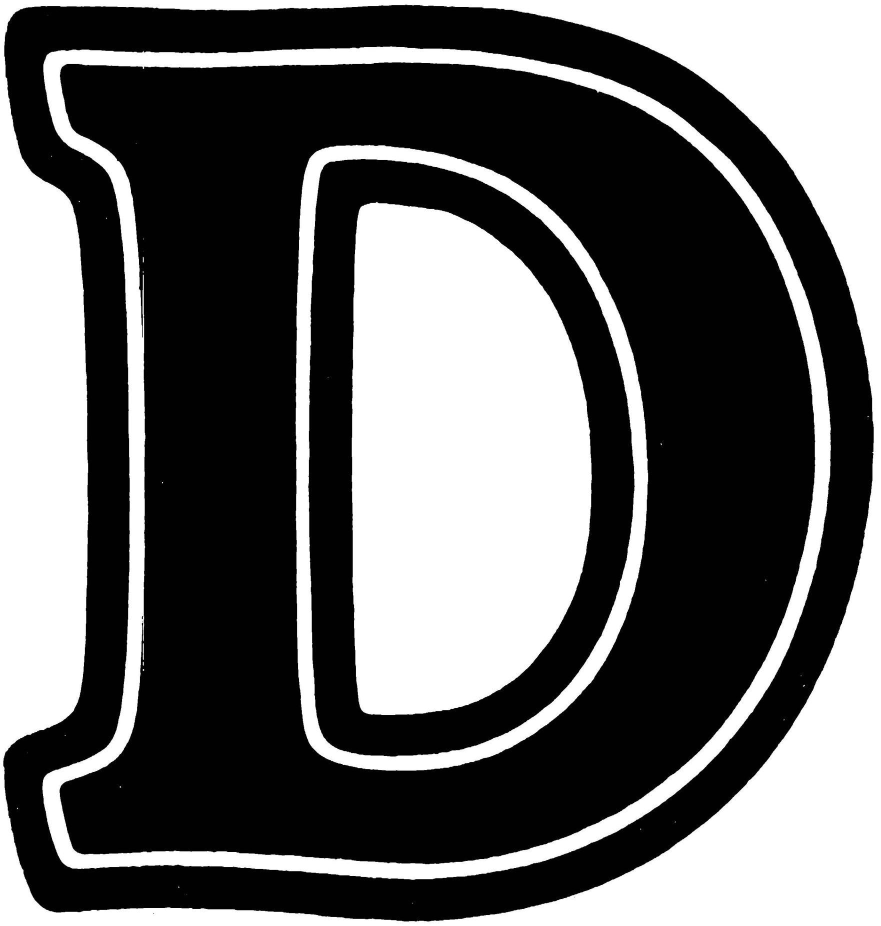
To allow us to play the keyboard, our program must first see if a key is pressed. If it is, the program must evaluate which note that key corresponds to and gate a voice on with that particular frequency. To sound piano-like, when a second key is hit (after the first is released) the first sound should still be able to be heard. In order to do that, our program must "cycle" through the voices. To put this another way, the first key pressed will play the first voice, the second key will play the second voice, the third the third voice—and the fourth will go back to the first voice. A statement such as:

VOICE=VOICE + 1: IF VOICE>2
THEN VOICE = 0

will cycle the voice counter. The IF statement ensures the variable VOICE doesn't go out of the range of 0 to 2.

Load the program from our last installment (refer to page ??), delete lines 450 onward and enter the following:

```
500 SID=54272
510 VOICE=0:OCT=4:WAVE=32
520 VM=7:HI=256
530 FORI=0TO23:POKESID+I,0:NEXT
540 POKESID+24,15
550 READA,D,S,R,PW
560 FORI=0TO2:INDEX=SID+I*VM
570 POKE INDEX+5,A*16+D
580 POKEINDEX+6,S*16+R
585 POKEINDEX+2,PWAND255
590 NEXT
600 DATA5,11,10,0,800
686 POKEINDEX+3,PW/HI
700 K$="Q2W3ER5T6Y7UI9O0P@-*£↑"
710 DIMK(255)
720 FORI=1TOLEN(K$)
730 K(ASC(MID$(K$,I,1)))=I
740 NEXT
750 PRINT:PRINT" 2 3   5 6 7   9 0   - £"
760 PRINT"Q W E R T Y U I O P @ * ↑"
800 GETA$:IFA$=""GOTO800
810 KEY=K(ASC(A$))-1:IFKEY<0GOTO800
820 IFKEY>11THENFRQ=F(OCT+1,KEY-12):GOTO835
830 FRQ=F(OCT,KEY)
835 FH=INT(FRQ/HI):FL=FRQ-FH*HI
840 INDEX=SID+VOICE*VM
850 POKEINDEX,FL:POKEINDEX+1,FH
860 POKEINDEX+4,WAVE:POKEINDEX+4,WAVE+1
870 VOICE=VOICE+1:IFVOICE>2THENVOICE=0
880 GOTO800
```



Line-by-line explanation of the program:

500 Assigns the address of the SID chip to the variable "SID."

510 Initializes variables "VOICE" (current voice being played), "OCT" (current octave the keyboard notes begin at) and "WAVE" (the current waveform to be POKEd into the control register of a voice).

520 Sets two constants. VM (Voice Multiplier) is set to 7 because there are 6 bytes to control each voice and the memory address of the start of each voice is computed by VOICE*VM. HI is set to 256, which is the high order value divisor. See Part 1 in this series for an explanation of how certain values are represented by two values—"lots" of 256 plus a remainder.

530 This FOR . . . NEXT loop initializes the SID chip register to zero to ensure that no previously run program will effect this one.

540 Sets SID register 24 to 15. 24 is the volume register, and we are setting the volume to 15, which is the maximum value.

SID

550 Reads in the envelope and pulse width parameters we wish to test from the DATA statement at line 600. The variables A, D, S and R represent the four parts of the envelope: Attack, Decay, Sustain and Release. PW is Pulse Width.

560 Start of a FOR . . . NEXT loop that will set the three voices in the SID to the parameters just READ. INDEX is set to the start address of the block of seven bytes for the current voice.

570 Puts the attack and decay values into register 5 of the current voice.

580 Puts the sustain and release values into register 6 of the current voice.

585 Puts the low value of the pulse width into register 2 of the current voice.

586 Puts the high value of the pulse width into register 3 of the current voice.

590 Continues looping until done with the NEXT command.

600 DATA to be tested. This consists of Attack, Decay, Sustain, Release and Pulse Width (if that waveform is used).

700 K$ is set to hold all the keys that can be played. You should note that these keys represent a piano layout on the keyboard.

710 Dimensions the K< array. This will be an array of the key positions subscripted by the ASCII value of the keypress. This is necessary because we need to know the key position along the piano layout to calculate the frequency that should be used.

720 Start of a FOR . . . NEXT loop to assign the K< array. The loop goes from 1 to the number of characters in K$, which is calculated using the LEN< function.

730 This gives the ASCII value of the i'th character in K$.

740 Continues the loop.

750-760 Prints the keyboard on the screen.

800 Main loop. Checks the keyboard. If nothing is pressed, it goes back to this line again and continues checking.

810 Assigns KEY to the position of the keypress on the keyboard minus one. Since elements of the array for keys not included in the "piano" will be equal to zero, this expression will equal minus one if an invalid key is pressed. The IF statement checks for invalid keys by seeing if KEY < 0. If it is, the program goes back to the keyboard checking line again.

820 There are 12 notes in an octave. Since there are more than 12 keys in our piano layout, the program must check for this, and if the key position is greater than 11, it must subtract 12 from the key and add 1 to the octave. Instead of *actually* adding 1 to the octave and subtracting 12 from the key, this line evalues the frequency right there with the subscripts OCT + 1 and KEY − 12 and skips the next line, which would calculate the frequency normally.

830 Gets frequency from the array.

835 Evaluates the low and high values of the given frequency in variables FL and FH.

840 INDEX is set to the start of the voice block of registers.

850 The low and high frequency values are now POKEd into the SID. INDEX is equal to the position of the low byte of the frequency and INDEX + 1 to the high byte.

860 Because we cannot detect the duration of the keypress, the voice is gated off and then on, so the A-D-S cycle is executed when a key is depressed. The voice is gated off first, so the release will have been completed before we gate the voice on. To release, register 4 (the control register) is POKEd with WAVE (the value of the current waveform) which is either 16, 32 or 64 (or 128 for noise, but this isn't particularly musical.) To start the cycle it is POKEd with WAVE + 1.

870 This cycles the voice, as was explained earlier, so that each successive keypress uses the next available voice. This gives the user the ability to more or less play chords by playing keys in rapid succession.

880 This loops the program back to the start of the main loop to check the keyboard again.

Read the description of the program

carefully, until you understand how it works. Check for any mistakes and SAVE the program *before* entering the RUN command, because if you've made a mistake you might cause an unrecoverable crash and have to do all that typing again!

When you've SAVEd the program RUN it and you should (famous last words), after a second or two, see the layout of the keys to play appear on the screen. You can then play the keys and you'll hear the envelope that the program is using.

OK, maestro, the playing's over; it's back to work. Now it's time to experiment! The key line to change is the DATA statement in line 600. Press the STOP key and enter:

```
600 DATA 3,9,0,0,800
```

This will make the attack and decay shorter than before. You may note we have a sustain level of zero, which means the decay will fade to NO volume (or very close).

RUN the program again and hear the difference. Experiment with other numbers. For example, if you have the sustain number (the third one) greater than zero, the notes will stay on until the VOICE variable has cycled around to the same voice again and it is changed to a new note.

The VOICE cycling line (870) could also be changed so the piano becomes monophonic (one voice) by changing VOICE>2 to VOICE>0. Try that. Also, the octave and waveform could be changed. Try entering:

```
510 VOICE=0:OCT=2:WAVE=16
```

This will produce notes two octaves lower than before, and is now using the "mellow" pulse wave.

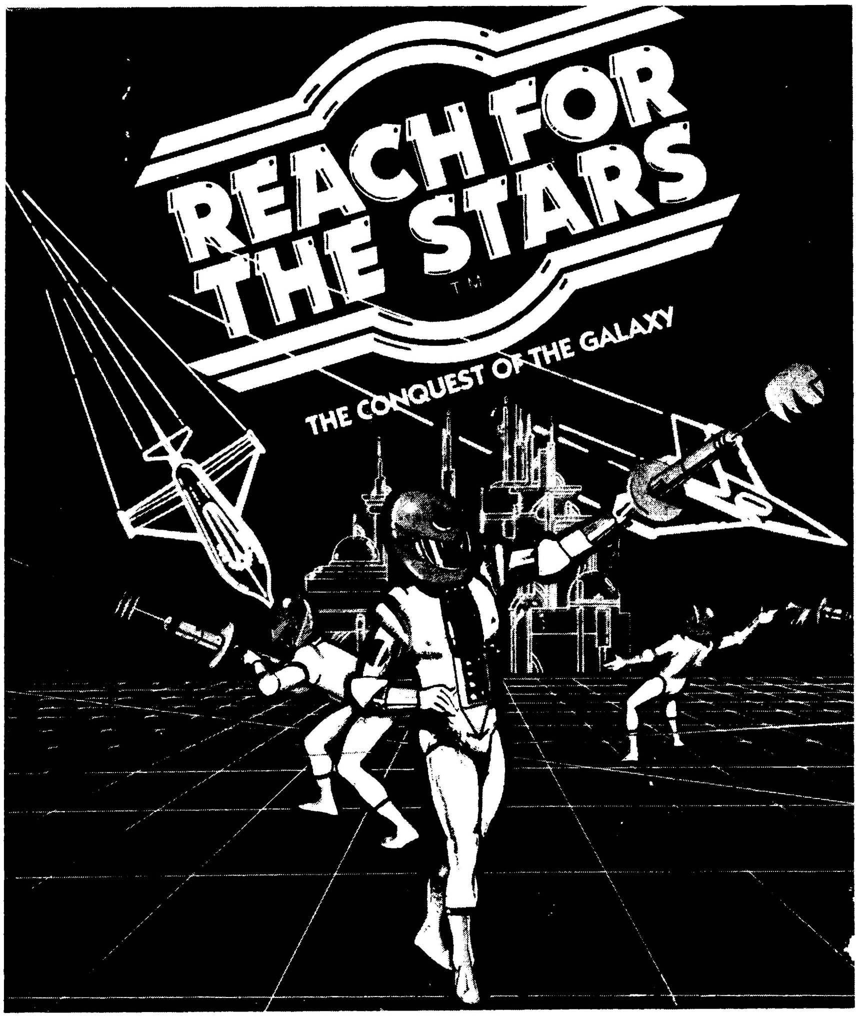
This simple program actually provides quite a bit of flexibility, although, because it's written in BASIC, it does have some limitations. For instance, no real-time special effects can be performed and the duration of keypress cannot be checked. Look out for a cartridge coming out soon that does all this and more! Also, a real synthesizer keyboard add-on with more SID chips is coming soon!

I would expect this is enough for this time. This program should give you a much better feel for how the various parameters affect the sound on your Commodore 64. Next time we can go on to look at the filter. Have fun! **C**

Program from Part 2

For those who missed the last issue this is the (corrected) base program from Part 2 of "Making Friends with SID." You need it to start off on your programming adventure here in Part 3. For those who tried entering it from the last issue, please note the corrections in lines 110 (the ↑ was left out) and 485 (the first POKE is supposed to be s+6). Also note that in that issue there was an error in the text on page 43, second full paragraph. The last lines in that paragraph should read "the ratio between semitones is 2↑(1/12):1".

```
100 FR=3520 :REM NOTE 'A' IN TOP OCTAVE
110 CO=2↑(1/12):REM CONSTANTMULTIPLIER FOR NEXT SEMITONE
120 FORI=1TO9:FR=FR/CO:NEXT:REM START FR AT 'C' BY GOING BACK 9 SEMITONES
130 SS=16777216:REM SID CLOCK
140 CS=1022730:REM CPU CLOCK
150 FC=SS/CS:REM FREQUENCY MULTIPLYING CONSTANT
200 DIMF(7,11):REM FREQUENCY ARRAY (OCTAVE,SEMITONE)
300 FORI=0TO11:REM CYCLE THROUGH 12 SEMITONES
310 S=FR*FC:REM CALCULATE SID VALUE OF SEMI TONE IN TOP OCTAVE
400 FORJ=7TO0STEP-1:F(J,I)=S:S=S/2
410 NEXT:REM CALCULATE VALUE FOR ALL 8 OCTAVES
420 FR=FR*CO:REM GO ONTO NEXT SEMITONE
430 NEXT:REM CONTINUE THROUGH ALL 12 SEMITONES
450 REM
460 REM PRINT OUT ALL THE FREQUENCIES
470 S=54272:REM START ADDRESS OF SID CHIP
475 FORI=0TO24:POKES+1,0:NEXT:REM INITIALIZE SID CHIP
480 POKES+24,15:REM SET VOLUME
485 POKES+6,11:REM ATTACK=0:DECAY=0:SUSTAIN=0:RELEASE=11
500 PRINT"FREQUENCY TABLE"
510 PRINT"---------------"
520 PRINT"OCT SEM FREQUENCY"
600 FORI=0TO7
610 FORJ=0TO11
620 PRINTI;TAB(4);J,INT(F(I,J))
624 POKES+4,32:REM GATE OFF THE VOICE FIRST
625 H=INT(F(I,J)/256):REM CALCULATE HIGH BYTE OF FREQUENCY
626 L=F(I,J)-H*256:REM CALCULATE LOW BYTE
627 POKES,L:POKES+1,H:REM PUT IN FREQUENCY
628 POKES+4,33:REM NOW GATE IT ON
629 FORK=1TO100:NEXT:REM WAIT A BIT
630 NEXTJ,I
```



REACH FOR THE STARS
TM
THE CONQUEST OF THE GALAXY

GETTING STARTED

With REACH FOR THE STARS

Mervyn Beamish

When we first got REACH FOR THE STARS I decided not to review it. After spending an hour or so neither Wayne or myself could make out quite what we were meant to do and more importantly how we were meant to do it. I have to state now – some 40/50 playing hours later – that once mastered this might be the only game you'll ever want to buy for your C64. Indeed it would worth buying a computer to play it. Definitely one of my most favourite games and a classic.

So what is the hassle? I think it boils down to the interpretation and expectations of a computer enthusiast compared to those of a strategic games player.

It is interesting that my office had cause to contact one of the Co-authors of 'Reach for the Stars' and mentioned the problems we had. His good natured reply was "OH! You haven't played a proper strategic game before then?' He did go on to give some helpful hints.

In an effort to review the game and demonstrate the scope and involment in the game I will go through the steps on getting it up and running. however, it must be stressed that there is no correct way to win a game. It is highly unlikely that one could play the same set of circumstances twice. Got you puzzled?

Lets start

You have in front of you a very attractive box containing two maps (DATA CARDS), players manual for the Apple computer, a supplement for the C64 and a disk.

First things first. Originally this game was written for the Apple, when it was converted to the C64 a few minor (and I mean minor) alterations had to be made. Primarily the only difference is that one presses (ESC) on the Apple and you use (F7) on the C64.

Aim of the game

The manual tells us – " 'Reach for the Stars' is a Strategic Level simulation of colonization, expansion and conflict in a hypothetical Galaxy. Each two-turn period of game time represents a generation, each hex on the Star Map represents a 'long way'.

You are responsible for the survival of a race. You must explore new star systems and colonize the most promising ones. The rescources produced by your planetary economies are used to build starships, transports for emigating populations, planetary defences and increased industrial capacity. In addition, rescources are required to improve the the planetary enviroment, to research and develop new starships technologies and to provide the consumer services so necessary for your populations' willing co-operation.

Given the pressures of four expanding empires, conflict is certain to occur. How well you balance the necessity for economic growth with the need to maintain effective overall performance.'

LOAD/RUN "DISPLAY"

Place the disk in and LOAD/RUN 'DISPLAY'. You are then told that the program will take two minutes and thirty seconds to load (which it does).

First screen image is the game menu. Here you are confronted with details of four players. I will assume that you are playing against the computer. You are player one – you are told that you are human(?!!). Press (1) to enter your name and RETURN. Then you note that the other three players are computer generated and of vetran status. That's a bit unfair, press (9, 6, C) and presto they are now beginners. There is more you can do with this and other screens but I'm just going through the rudiments and attempting not to get bogged down.

The next screen looks like this:-

```
          "REACH FOR THE STARS"
               (OPTIONS)

1) SCENARIO LENGTH   *[40]* 80 * 150 *
2) NOVAS            3) NATURAL DISASTERS
4) XENOPHOBES   5) SOLAR DEBRIS EFFECT
6) RANDOM STAR MAP
7) TASK FORCE SET-UP
8) VARIABLE PRODUCTION COSTS
9) VARIABLE VICTORY CONDITIONS
(R)ETURN TO FIRST PAGE OF MENU

        HIT SPACE BAR TO CONTINUE
```

This is how the second page should look for your first game. The 40 turn scenario is in effect. All other options are not.

Forget items 2-9 they are for advanced players just choose a SCENARIO LENGTH OF 40 TURNS by hitting (RETURN). This option determines the length of the game to be played, it can be the difference between 3 to 30 hours. You can choose another length by hitting (1) if you wish.

...and now into the game

The screen displays a small section of the map around a figure (1-9). In this case it is six star systems around (1) but it may vary from game to game. (Don't get confused the names on the map are those of star systems and not necessarily single stars). Compare the star systems on your map to those on the scren. Bottom of the screen reads.

PLAYER: Name
TURN: 1
PHASE: PRODUCTION
HIT (C) TO CONTINUE

We hit (C).

We are now in another part of the galaxy around the figure 4 – Why the change I'm not sure but nothing is wrong. The bottom of the screen tells you the following information:-

Your home star system is PROCYON, it is F:GREEN #1 PRIMARY – other than the name forget the rest. The screen tells you that POPulation is 85, INDustry is 40, SOCiety is 80. These are the optimum levels on your planet. Just note these figures in your mind, they will come up again.

In the centre of the screen is a white flashing cursor – thats your Star System.

Press (P). There you are the total map of the galaxy and that flashing blue cursor is you. OK (SPACE) and we're back again.

(RETURN) will get you the next screen

AHH!!! Now just calm down and we'll work our way through it. This is your 'State of the Nation Report'. The first two lines confirm that you are on PROCYON you can change this name to one of your own choice by using (N) but don't.

Next comes a run down of the planetary system. OWNER is you, player (1). You have a POPulation of 50 (on the left) and an optimum population of 85 (on the right). Similarily INDustry 15/max. 40, SOCial 50/optimum 80. Then Planetary Defense Bases 12 is the exsisting number on the planet, forget the (*) its to do with ownership.

Now we come to the report proper. Although a little worring to look at in my mind this is the exciting part of the game .

Forget the (L) LEAVE option. Top right hand of reprot refers to RESOURCE POINTS in other words CASH/MONEY. First look for AVAIL RP'S. This is the amount of money you have in your pocket. Next USED RP'S. This is the amount of money automatically put aside for defence and population up keep. PLANET RP'S equals the cash generated by the planet each turn. You'll be given about 126 to start with and it will be controlled by you from here in. GLOBAL RP'S basically is the cash you have not spent in the previous turn. You are given 200 to start with GLOBAL + PLANET = AVAIL + USED.

The Magic Formula

RP'S are calculated by a mathematical formula that you'll find in the manual. It is based on the relationship between POP, IND and SOC. A high SOCial level and INDustry capacity will produce the greatest number of RP's.

So primarily we are in a situation that we have 126 units of cash to spend.

Next comes a list on what you can spend it on. Each item is followed in brackets with how many units you can buy with the cash available.

Start from the top. Because IND is one of the prime ingredients in the generation of money lets buy 10 units (your DATA CARD tells you that they cost 10 RP's each). Type (10, RETURN). Note the AVAIL and USED RP figure have automatically adjusted themselves as have the number of units you can buy of other products.

Next option EXPLORERS. You know nothing about any other star systems in the galaxy until one of your ships have visited them. Explorers are inexpensive ships (3RP's each) which can be sent out on a voyage of discovery. However, they have no fighting power and if they come to a star system where there are other ships, from transport status up, they are automically destroyed. Let's get (5, RETURN) (Total 15 RP).

TRANSPORTS – At this stage we don't need them. They are ships that have a small fighting power and are needed when invading or colonizing other star sytems. They can also be used to 'cream off' excess population. (RETURN)

MARK I – A battle ship. When we get onto ship development I'll explain about MKII-IV ships. Lets get 2 (14 RP's each). Leave one over our planet to destroy other players explorers and move the other around.

SOCIAL LEVEL – if the SOCial level is below 40, POPulation will drop, if its above 60 POPulation will rise (a very generalised overview) so lets buy 10 units of SOCIAL REASEARCH (4 RP's each).

PLANET ENVIROMENT. I find this hard to understand what it is about but the more spent on this area the less problems I seem to have with SOCIAL level and INDustry variations later in the game – 10 units (8 RP's each).

SHIP DEVELOPMENT – The amount of money you spend on research and development of spaceship technology will determine the power and the speed of the battleships you can buy. For example a MKI will take two turns to get from home star system to a system 8 hexes away (refer map) while a MKII will take only one. Two mark two ships will have a bit of a problem in combat against a MKIII, yet two MKI's and a MKII could stand a good chance against the same ship. Lets buy 50 units (1 each at MKI level).

PLANETORY DEFENSE – The computer has already allocated 12 units which we can reduce or increase as we like. Naturally if we reduce we loose bases but by increasing we can buy additional bases (4 RP's each). Lets buy 2 more (12 RP'S maintenance on existing bases and 8 RP'S for two new ones).

SERVICE POPULATION – The computer has allocated 50 (1 unit per POPulation). This determines the standard of living. If you want to reduce POPulation you can reduce this figure. By doing so you may also end up with dropping INDustry levels and a civil uprising that dramatically reduce your figures across the board. We'll leave it as it is.

We have now set our first production schedule. Bye the bye we could have pressed (CTRL, C) and the computer would have given us a suggested schedule.

On to Movement

Press (F7). We are back on our screen with the flashing white cursor only this time there is a spaceship there:-

OUR FLEET.

We are in the Movement Phase. Press (RETURN) and the bottom window looks like this
(E = EXPLORERS, 1 = MKI SHIPS etc)

```
SAMPLE
E : 5
T :
1 : 2
```

First look at our two MARK I ships. At present the ships form a single task force, we need to split this fleet into three. Press (F)

```
TASK FORCE : I OUT OF I :          * RASTABAN *
E.        5  12: (S)ET OBJECTIVE   * RASTABAN *
T.        0   0: (C)OLONIZE        :(Q)UIT
I.        2   0: (F)ORM (E)XAM     :(ESC)EXIT
```

TITLE:	Reach for the Stars
PRICE:	$45.95
AUTHOR:	Roger Keating
PUBLISHERS:	Strategic Studies Group
SAMPLE FROM	The VIC Centre 416 Logan Rd., Stones Corner QLD Phone (07) 397 0888

Moving the cursor down to MKI and press (1, F7). You're back to your previous screen but now only one MKI is showing. We want to move this one to VEGA. How did I know the name? – I looked on the MAP! Whats more you can count the number of HEXES (4) and know that a MKI with its travel allowance (DATA CARD) of 5 will make it in one turn. Press (S) and we are Setting an objective for our battleship. The screen window has changes. There are a number of other options now – forget them for the present. Press (N)ame the window changes again, ignore it and just type in the name of the system we want to travel to (VEGA, RETURN) sometimes the computer will beat you to the punch and type in the the name prior to you completing the total name – here it did it on the letter V. Back to the original window press (Q).

Now repeat that all again press (F) separate out the other MK1 but this time, as we wish it to stay over our own star system, press (Q).

We're back again. Do we have to separate each individual Explorer!? Nope – you can if you wish but just press (CTRL,X) and the computer will disperse them over the galaxy for you.

The screen beeps at you.

You are at the end of the phase press (F1).

The window changes to give you the option to End phase (which has already ended!?) Ignore everything and press (E). In the last couple of moves things may not go as planned but perservere.

Now the window is cleared and the screen just shows the section of the MAP around 4 on what ever. Just wait, as the game goes on the wait will become longer but you will see spaceships and battles etc happening all over the galaxy especially around turn 30. All the noises etc. will start making sense as you get into the game.

We now come back to the beginning, we've completed turn 1. Turn 2 and every even turn is movement only.

So What!?

Press (C) the map has been changed slightly and there maybe other ships indicated these are our explorers and MKIs. Press (P). There is the full MAP with the location of all our ships (white dots and flashing blue cursor). Later on in the game other symbols will indicate collonies under attack etc. (SPACE, CTRL B).

We now have UTILITY OPTIONS on the screen. Ignore everything excepting 7. Press (7). Here is a list of planets as you work your way through them you will find that most are in reverse type these are the ones you know nothing about. The others have details i.e. POP/IND/PLANETARY ENVIROMENT etc. If a planet is listed not in reverse but with no details it is uninhabitable. Press (F7, SPACE, SPACE) your back to the game.

From here on folks your on your own. Colonisation routines, battles, attacks and invasion are ahead of you and have their own set of rules and routines.

This article is designed to help you break the ice and if you can get through turn one with it, turn two by yourself, the supplied manual will start making sense. There will be no stopping you.

Your battleship strategy, the defense expenditure, transportation and research polices are yours to experiment with and develop. Good hunting.

SUMMING UP

Accolades to the authors of 'Reach for the Stars', the most brilliant game I've played and played and played on my C64.

Rap over the knuckles for the same people – there are so many combinations and permutations of options in this game. While quite understandable to a strategic games player I believe they are confusing and a 'put-off' to the beginner.

Could I suggest that when the manual is re-published that a 'Getting Started' section be included in the beginning. This section would tell you what to ignore for the time being and just the bare bones to get in and start playing. The manual, as written, will make a lot more sense and you'll have, in most cases, new converts to the style of game that you are most expert at writing.

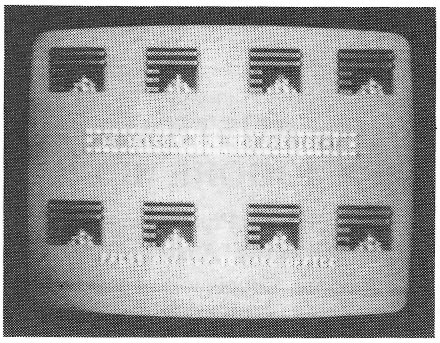
Continued from page 6

An excellent game, though I do think there is too much an element of chance to it. Also it became obvious that if one player got too far ahead of the others he or she would be more prone to disasters – at one stage this got to be quite ridiculous.

BANANA REPUBLIC

You play the role of a dictator in a small but important independant state, your aim is to stay in power for as long as possible fighting oppostion from all sectors of your population.

The screen graphics on all these games are excellent (to make up for the packaging, no doubt). First impression of the games is that they are childishly simple. Within two or three moves this impression changed completely.



The Banana Plantation workers are revolting. Your popularity with Russia is at an all time low because you have just agreed to have a US tracking station built in the country.

At this rate how long can you stay in power before you are ...... Well, you know what they do in these places.

If ever you wanted to exchange places with BOB HAWK, here is your big chance. You battle popularity polls and industrial decisions. You have to pay the treasury department to get a report on the state of the nation – it is all there. (you can even feather your own nest – if you dare!).

Good graphics again help make this an excellent game.

These three games are representative of a collection of about eight games. They are not your run of the mill computer games and are of excellent quality. I wonder if they are on cassette, although ARMAGEDON would take about ten or fifteen minutes to load, I think.

Some of the best screen graphics I've seen for these style of games and on whole very engrossing to play.

TITLE:	Armageddon Black Gold Banana Republic
PRICE:	(T) $20.95 (D) $24.95
PUBLISHER:	Photronic
SAMPLE FROM	The VIC Centre 416 Logan Rd., Stones Corner QLD Phone (07) 397 0888

COPS AND ROBBERS

A brilliant arcade style game for the 64 that places you in the position of a criminal attempting to rob a factory of its valuable jewellery, a mine of its precious treasure and a prison of its inmates (members of your gang).

As you leave the safety of your car the police are alert to your presence and immediately send out patrols to track you on the ground as well as a helicopter to get you from the air. As you race though the maze of streets you avoid them and head for your destination.

In the factory you have various levels, (which you reach via an elevator), on which to practice you skills. Use your gun to kill any guards who get in your way and get all the valuables.

When you enter the mine you find that instead of police to battle you are faced with ghost who are somewhat over-friendly and keep trying to put you on their level (in other words kill you). Luckily the can be "killed" with your gun. If they get you its off to the morgue; if you live you get the treasure.

In case you find that all your friends have been caught you can go to the jail and try to break them out. Watch out for police and free your friends and they will join you and give you a greater chance of living a longer and prosperous life.

Don't go around killing too many people you might run out off bullets.

Great sound effects and colourful graphics make this a very entertaining game for any age and when I finish my prison sentence I'll be back to try it again.

TITLE:	Cops & Robbers
PRICE:	$19.95
PUBLISHER:	Ozisoft Pty Ltd.
SAMPLE FROM	Ozisoft Pty Ltd. 50 Clarence St, Sydney NSW Phone (02) 29 6330

NEOCLYPS 64

A fast moving space adventure game for the Commodore 64.

You have control of twelve fast flying spaceships in which you must save the planet Neoclyps. It has been taken over by an evil force of Bad Guys who have built an incredible defense system and have many warning radar to fight off any would be liberators of the populace. You must destroy all these and help liberate Neoclyps. The towers are hidden amoungst factories and deserts. You must destroy all the towers in each of four sectors.

Unfortunately they have learnt how to build and it seems that as fast as you clear up a sector the quicker they build more towers and start to fire missiles at you. With four different skill levels ranging from Beginner to Ace the standard of play can be varied to suit anyone.

To let you know how you're going in your fight for liberation there is a status board which you can call up at any time. This will tell you the score and what the situation in the quadrant you are in.

An excellent fast moving game for any age.

TITLE:	Neoclyps
PRICE:	(T) $29.95 (D) $34.95
PUBLISHER:	Computer Classics
SAMPLE FROM	Computer Classics 11-15 Falcon St Crows Nest NSW. Phone (02) 438 4866

GOLDEN APPLES OF ZEUS *For the VIC*

This is a beginners Adventure designed especially for those people who have never played or seen an Adventure game before.

It is a text Adventure which has as a lead up to the actual Adventure a comprehensive history of Adventuring and a list of the common keywords used in most of them it also gives a comprehensive guide to the most likely items you will encounter and their use.

The Adventure itself is not for the hardened adventurer but is an excellent one for the beginner to start as there is a limited vocabulary that is quick to learn. The idea is to get the

Golden Apples from the apple trees in the Garden of Zeus. It sounds simple and providing you can avoid being struck by lighning, going crazy and if you can manage to get around Zeus's pet dog lift that »%@¶?!! rock. Good luck!

THE SWORD OF HRAKEL

for the VIC

An Adventure in the true sense of the word, this Adventure is a definite brain teaser for even the most experienced Adventurer.

You return to your home town after a journey to find that the evil Mage has come along and put a curse on the town leaving you with the unenviable task of finding the legendary "Sword of Hrakel" and using it to destroy the Mage and return all the towns people back to their normal condition. Speaking of which has anybody a cure for an hysterical duck?!

A text Adventure, this has a lot going for it. The vocabulary available is large and offers the player a great deal of versitillity in the way that they play the game. Also ther is a variety of creatures, people and situations to encounter including amonst other things that slightly crazed duck, a rabid wolf and a meditating Guru (not to mention a town jail that would give Houdini a hard time.)

ZORGONS KINGDOM

for the VIC

This is an arcade game that consist of five different screens of increasing difficulty. The aim of the game is to get to Zorgon (a rather nasty monster) and destroy him. On the way you battle various minions of his (often you find that just when you think you have succeeded you have to fight another battle with the same nature) if you fail there is only one choice to start again. Though you do have a choice of how many lives you can have.

The graphics in it are good though they are of a limited form.

Control is offered in the choice of the joystick and the key board depending on which side of the tape that you load (a word of warning the copy I was given had a slight error in the packaging and the side that suppossibly had the joystick version had the keyboard one and vice versa. This was not a large problem just an annoying one.)

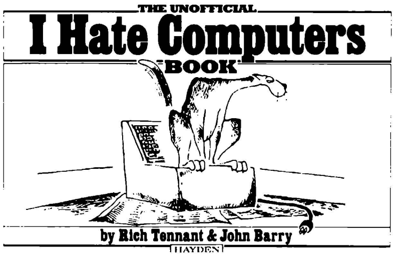
Overall the Romik games are very enjoyable to play and can provide hours of entertainment especially if you get stuck in an adventure.

TITLE:	Sword of Hrakel Zorgons Kingdom
PRICE:	$19.95
PUBLISHERS:	Romik Software
SAMPLE FROM	The VIC Centre 416 Logan Rd., Stones Corner QLD Phone (07) 397 0888

Continued from page 25

THE UNOFFICIAL "I HATE COMPUTERS BOOK"

review: Harry Perlich

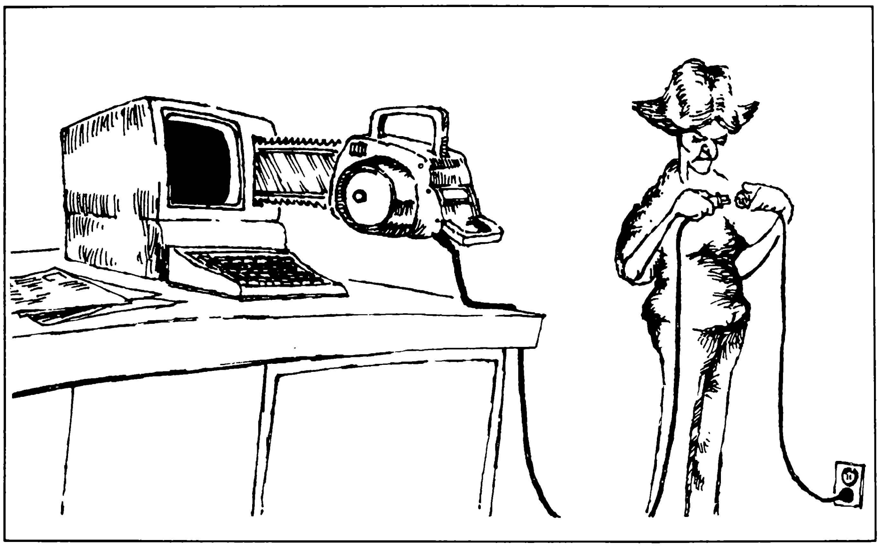


And this is the unofficial review.

I suppose that this is another one of those coffee table booklets in the genre of 'A hundred uses of a dead cat'. Nevertheless, though that concept has become a little tired, it has recieved excellent treatment here. A number of the picture stories are excellently funny, (pieces of inspired maliciousness).

This booklet is, of course, particularly apt for computer afficionados but it will appeal to almost anyone; the humour is not too specialised to understand.

TITLE:	The Unofficial I hate Computers Book
AUTHOR:	Rich Tennant & John Barry
PUBLISHER:	Hayden Book Company
SAMPLE FROM	Holt-Saunders Pty Limited 9 Waltham St, Artarmon NSW Phone (02) 439 3633



THE AUSTRALIAN COMMODORE REVIEW

Gareth Powell Pty Ltd announce the publication of the "Australian Commodore Review", a magazine devoted entirely to Commodore computers and their users. The magazine will be published monthly, with the first issue commencing in late February.

The "Australian Commodore Review" will be an independant magazine. When we have a criticism, we will say so, but our main reason for publishing the magazine is because we believe that Commodore machines represent the best value for money in microcomputers today. There will also be articles on peripherals devices, programs and business applications, of interest to as large as a number of Commodore users as possible.

Another publication of ours, the "Australian Apple Review", has been a major success. It has had a high amount of user and dealer interest, and has attracted a large number of subscriptions. Dealer interest in the Commodore magazine has already been great, as dealers all over Australia are selling in excess of 20,000 Commodore machines a month.

Work Horse - Revisited

Our apologies to our readers but we left the last page of this program listing out of last issue. It is printed here. - Ed.

```
1800 i=(n+1)
1810 input#1,n$(i),n1$(i),n2$(i) .n3$(i)
1820 ifi>5thenprint"▒LOADING"  :ifn$(i)  ="▨"then1840
1830 i=i+1:goto1810
1840 ifg$="n"then1860:j=z
1850 open3,4
1860 forn=zto(i-1)
1870 printn$(n)
1880 printn1$(n)
1890 printn2$(n)
1900 printn3$(n)
1910 letai(n)=n
1920 ifg$="n"then nextn:goto1980
1930 print#3,n3$(n)".....";
1940 print#3,n$(n)".  ";
1950 print#3,n1$(n)".....";
1960 print#3,n2$(n)
1970 nextn
1980 close3
1990 close1
2000 input"▒m▒enu to return to menu";s$
2010 ifs$="m"then1060
2020 goto1990
2030 input"do you wish to change file name:";w$
2040 ifw$="n"then2080
2050 ifw$="y"then2070
2060 goto2030
2070 input"▒▒▒NEW data file:";d$
2080 open1,8,1,d$
2090 for i=1ton
2100 print#1,n$(ai(i))
2110 print#1,n1$(ai(i))
2120 print#1,n2$(ai(i))
2130 print#1,n3$(ai(i))
2140 nexti
2150 print#1,"▨"
2160 close1:goto1060
2170 input"▒▒▒ITEM No. to begin with:";p:print:print
2180 n=p
2190 print"ITEM    ";n:print:print
2200 printn$(n):print
2210 printn1$(n):print
2220 printn2$(n):print
2230 printn3$(n):print
2240 print:print:print
2250 input"Is this correct y/n";o$
2260 ifo$="y"thenn=n+1:print"▒▒▒▒":goto2190
2270 ifo$="n"goto2290
2280 goto2170
2290 print:input"FAMILY NAME  :";n$(n):print
2300 input"GIVEN NAME   :";n1$(n):print
2310 input"D.O.BIRTH    :";n2$(n):print
2320 input"PAGE No.     :";n3$(n):print
2330 print"▒▒▒▒":goto2190
3000 open1,8,0,"file name"
3010 get#1,a$
3020 ifa$=""then1010
3030 printa$;
3040 goto1010
```

The Enhanced VIC – 20

Joel Swank, Beaverton

Part 3: Interfacing an MX – Printer

Continued from Vol. 3 Issue 5

From "The Enhanced VIC20, Part 2" by Joel Swank appearing in the March 1983 issue of BYTE magazine. Copyright © 1983 Byte Publications, Inc. Used with permission of Byte Publications, Inc.

Listing 1: *The VICEPS program is a software interface between the VIC-20 and the MX-80. It controls output to the printer.*

```
LINE#  LOC   CODE      LINE

0001   0000                VICEPS : VIC-20 INTERFACE TO THE EPSON MX-80 PRINTER
0002   0000                         VIA THE VIC PARALLEL USER PORT
0003   0000                         THE EPSON MUST HAVE GRAFTRAX

0004   0000                ZERO PAGE LOACTIONS

0005   0000            RVSMOD =$C7          ;REVERSE MODE FLAG
0006   0000            QUOTMO =$D4          ;QUOTE MODE FLAG
0007   0000            VICPAT =$FB          ;TEMPORARY ZERO PAGE POINTER

0008   0000            ;   VIC PIA LOCATIONS
0009   0000            IORB1  =$9110        ;I/O REG B
0010   0000            DDRB1  =$9112        ;DATA DIRECTION REG B
0011   0000            PCR1   =$911C        ;PERIPHERAL CONTROL REG
0012   0000            IFR1   =$911D        ;INTERUPT FLAG REG
0013   0000            IER1   =$911E        ;INTERRUPT ENABLE REG

0014   0000                TV CONTROLLER LOCATIONS

0015   0000            TVCTL5 =$9005        ;CHARACTER SET/SCREEN BUFFER PORT

0016   0000                VIC SUBROUTINES

0017   0000            VICOUT =$F27A        ;ROUTINE TO SEND CHAR TO SCREEN

0018   0000                VIC RAM

0019   0000            SYSA   =$30C         ;A REG STORAGE FOR SYS COMMAND
0020   0000            SYSX   =$30D         ;X REX STORAGE FOR SYS COMMAND
0021   0000            DISVEC =$326         ;VECTOR TO SCREEN DISPLAY ROUTINE

0022   0000                EQUATES

0023   0000            CR     =$0D          ;RETURN CHAR
0024   0000            INSDEL =$14          ;INSERT-DELETE CHARACTER
0025   0000            ESC    =$1B          ;ESCAPE CHARACTER
0026   0000            LF     =$A           ;LINE FEED CHARACTER
0027   0000            LINLIM =60           ;MAX CHARACTERS PER LINE
0028   0000            LPIGRF =8            ;PRINTER GRAFIC DENSITY CODE
0029   0000            LPI8   =9            ;8 LINES PER INCH CODE
0030   0000            LPI6   =12           ;6 LINES PER INCH CODE

0031   0000                   *=$1C00

0032   1C00            ;**
0033   1C00            ;***   OPENG : ENTRY POINT TO TURN ON ROUTINE TO
0034   1C00            ;**            ECHO CHARACTERS TO THE PRINTER IN
0035   1C00            ;              IN FULL VIC GRAPHICS

0036   1C00  20 26 1D  OPENG  JSR INITOT    ;INIT THE PIA FOR OUTPUT
0037   1C03  A9 30            LDA #<GRFOUT  ;MOVE OUTPUT ROUTINE ADDRESS
0038   1C05  8D 26 03         STA DISVEC
0039   1C08  A9 1C            LDA #>GRFOUT
0040   1C0A  8D 27 03         STA DISVEC+1
0041   1C0D  20 6A 1D         JSR INITPR    ;INITIALIZE THE PRINTER
0042   1C10  20 40 1D         JSR INILIN    ;INITIALIZE FOR FIRST LINE
0043   1C13  60               RTS

0044   1C14            ;**
0045   1C14            ;***   OPENA : ENTRY TO TURN ON ROUTINE TO ECHO
0046   1C14            ;**            CHARACTERS TO PRINTER IN ASCII
```

```
0047  1C14  20 26 1D  OPENA  JSR INITOT       ;INIT PIA FOR OUTPUT
0048  1C17  A9 16            LDA #<ASCOUT     ;MOVE ADDRESS OF ASCII DISPLAY
0049  1C19  8D 26 03         STA DISVEC       ;ROUTINE TO DISPLAY VECTOR
0050  1C1C  A9 1D            LDA #>ASCOUT
0051  1C1E  8D 27 03         STA DISVEC+1
0052  1C21  60               RTS

0053  1C22                   ;**
0054  1C22                   ;***    CLOSE : ENTRY TO TURN OFF EITHER ECHO ROUTINE
0055  1C22                   ;**

0056  1C22  A9 7A     CLOSE  LDA #<VICOUT     ;RESTORE VECTOR TO SCREEN
0057  1C24  8D 26 03         STA DISVEC       ;DISPLAY ROUTINE
0058  1C27  A9 F2            LDA #>VICOUT
0059  1C29  8D 27 03         STA DISVEC+1
0060  1C2C  20 A9 1C         JSR FILLIN       ;FINISH CURRENT LINE
0061  1C2F  60               RTS

0062  1C30                   ;***    GRFOUT : ROUTINE TO GENERATE VIC GRAPHICS
0063  1C30                   ;                ON THE PRINTER

0064  1C30  8D 9D 1D  GRFOUT STA ASAVE        ;SAVE CHARACTER
0065  1C33  48               PHA
0066  1C34  8A               TXA              ;SAVE ALL REGS
0067  1C35  48               PHA              ;ON STACK
0068  1C36  98               TYA
0069  1C37  48               PHA
0070  1C38  AD 9D 1D         LDA ASAVE        ;GET CHAR BACK
0071  1C3B  20 7A F2         JSR VICOUT       ;SEND TO VICS SCREEN

0072  1C3E                   ; NOW CONVERT THE ASCII CHARACTER INTO A VIC
0073  1C3E                   ;POKE CODE. KEY ON CR TO END LINE.
0074  1C3E  AA               TAX              ;HI BIT ON?
0075  1C3F  10 1C            BPL BITOFF       ;NO
0076  1C41  29 7F            AND #$7F         ;YES, TURN IT OFF
0077  1C43  C9 7F            CMP #$7F         ;CONVERT $7F TO $5E
0078  1C45  D0 02            BNE NOT7F
0079  1C47  A9 5E            LDA #$5E
0080  1C49  C9 20     NOT7F  CMP #$20         ;CONTROL CHAR?
0081  1C4B  B0 0C            BCS NOTCTL       ;NO
0082  1C4D  C9 0D            CMP #CR          ;RETURN?
0083  1C4F  F0 4B            BEQ FINLIN       ;YES
0084  1C51  A2 D4            LDX #QUOTMO      ;IN QUOTE MODE?
0085  1C53  F0 4D            BEQ GRFBAK       ;NO, THEN IGNORE IT
0086  1C55  09 C0            ORA #$C0         ;ON 2 HI BITS
0087  1C57  D0 26            BNE SAVPOK       ;TO MAKE POKE CODE
0088  1C59  09 40     NOTCTL ORA #$40         ;TURN ON BIT 6
0089  1C5B  D0 1C            BNE CKRVS        ;AND GO CHECK REVERSE

0090  1C5D  C9 0D     BITOFF CMP #CR          ;RETURN CHAR?
0091  1C5F  F0 3B            BEQ FINLIN       ;YES, END OF LINE
0092  1C61  C9 20            CMP #$20         ;CONTROL CHARACTER?
0093  1C63  B0 0A            BCS NOCTL        ;NOPE
0094  1C65  C9 14            CMP #INSDEL      ;YES, IS IT DELETE?
0095  1C67  F0 39            BEQ GRFBAK       ;YES, IGNORE IT
0096  1C69  A6 D4            LDX QUOTMO       ;NO, IS QUOTE MODE ON?
0097  1C6B  D0 10            BNE HIBIT        ;YES, THEN PRINT IT
0098  1C6D  F0 33            BEQ GRFBAK       ;NO, IGNORE IT
0099  1C6F  C9 60     NOCTL  CMP #$60         ;OVER $60?
0100  1C71  90 04            BCC LOWER        ;NO
0101  1C73  29 DF            AND #$DF         ;YES, OFF BIT 5
0102  1C75  D0 02            BNE CKRVS
0103  1C77  29 3F     LOWER  AND #$3F         ;TURN OFF BITS 6 & 7
0104  1C79  A6 C7     CKRVS  LDX RVSMOD       ;REVERSE MODE ON?
0105  1C7B  F0 02            BEQ SAVPOK       ;NO
0106  1C7D  09 80     HIBIT  ORA #$80         ;ON BIT 7 TO REVERSE CHARACTER
0107  1C7F  8D 9D 1D  SAVPOK STA ASAVE        ;SAVE POKE CODE

0108  1C82                      CHECK FOR FULL LINE
0109  1C82  AD 9E 1D         LDA LCOUNT       ;CHECK CHARACTER COUNT
0110  1C85  C9 3C            CMP #LINLIM      ;AT LIMIT?
0111  1C87  D0 08            BNE NOTFUL       ;NO, SKIP
0112  1C89  A9 0A            LDA #LF          ;SEND LINE FEED TO PRINTER
0113  1C8B  20 19 1D         JSR PUTCHR
```

```
1C8E  20 40 1D          JSR INILIN      ;SETUP FOR NEW LINE
1C91  AD 9D 1D  NOTFUL  LDA ASAVE       ;RETRIEVE POKE CODE
1C94  20 BF 1C          JSR SEND        ;SEND CHAR TO PRINTER
1C97  EE 9E 1D          INC LCOUNT      ;COUNT IT
1C9A  D0 06             BNE GRFBAK      ;SKIP TO END


1C9C            ;FINISH LINE
1C9C  20 A9 1C  FINLIN  JSR FILLIN      ;FILL LINE WITH BLANKS
1C9F  20 40 1D          JSR INILIN      ;INITIALIZE NEW LINE

1CA2  68        GRFBAK  PLA             ;RESTORE ALL REGS
1CA3  A8                TAY
1CA4  68                PLA
1CA5  AA                TAX
1CA6  68                PLA
1CA7  18                CLC
1CA8  60                RTS             ;AND RETURN

1CA9            ;***    FILLIN : FILL REMAINDER OF LINE WITH BLANKS
1CA9  AE 9E 1D  FILLIN  LDX LCOUNT      ;GET CHAR COUNT
1CAC  E0 3C             CPX #LINLIM     ;AT LIMIT?
1CAE  B0 0A             BCS NXTLIN      ;YES, QUIT
1CB0  A9 20             LDA #32         ;NO, SEND A BLANK
1CB2  20 BF 1C          JSR SEND
1CB5  EE 9E 1D          INC LCOUNT      ;COUNT IT
1CB8  D0 EF             BNE FILLIN      ;REPEAT
1CBA  A9 0A     NXTLIN  LDA #LF         ;SEND LINE FEED TO PRINTER
1CBC  4C 19 1D          JMP PUTCHR

1CBF            ;***    SEND : ROUTINE TO USE VIC POKE CODE TO FIND
1CBF            ;              THE CHARACTER PATTERN, CONVERT IT TO
1CBF            ;              THE PRINTERS FORMAT AND SEND TO PRINTER

1CBF            ;   FIRST CALC THE ADDRESS OF THE CHARACTER
1CBF  85 FB     SEND    STA VICPAT      ;SAVE POKE CODE
1CC1  A9 00             LDA #0          ;IN PATTERN POINTER
1CC3  85 FC             STA VICPAT+1
1CC5  A0 02             LDY #2          ;LOOP TO MULTIPLY THE POKE CODE
1CC7  18        MULT8   CLC             ;BY 8 TO GET OFFSET INTO CURRENT
1CC8  26 FB             ROL VICPAT      ;CHARACTER SET
1CCA  26 FC             ROL VICPAT+1
1CCC  88                DEY
1CCD  10 F8             BPL MULT8       ;THREE TIMES THRU
1CCF  A2 80             LDX #$80
1CD1  AD 05 90          LDA TVCTL5      ;USE DATA FROM TV CHIP TO
1CD4  29 0C             AND #$C         ;DETERMINE LOCATION OF
1CD6  F0 02             BEQ NOALT       ;OF CURRENT CHARACTER SET
1CD8  A2 10             LDX #$10
1CDA  8A        NOALT   TXA             ;ADD IN HI NYBBLE
1CDB  18                CLC             ;OF CHARCACTER SET ADDRESS
1CDC  65 FC             ADC VICPAT+1
1CDE  85 FC             STA VICPAT+1
1CE0  AD 05 90          LDA TVCTL5      ;CALC SECOND NYBBLE VALUE
1CE3  29 03             AND #$3
1CE5  18                CLC
1CE6  0A                ASL A
1CE7  0A                ASL A
1CE8  65 FC             ADC VICPAT+1    ;AND ADD IT IN
1CEA  85 FC             STA VICPAT+1

1CEC                CONVERT VIC PATTERN TO PRINTER PATTERN
1CEC  A0 07             LDY #7
1CEE  B1 FB     BYTLUP  LDA (VICPAT),Y  ;GET A VIC PATTERN ROW
1CF0  A2 00             LDX #0
1CF2  0A        BITLUP  ASL A           ;SHIFT EACH BIT INTO A
1CF3  7E 95 1D          ROR PRTPAT,X    ;COLUMN OF THE PRINTER PATTERN
1CF6  E8                INX
1CF7  E0 08             CPX #8          ;GOT ALL 8?
1CF9  90 F7             BCC BITLUP      ;NO, DO ANOTHER
1CFB  88                DEY             ;YES BUMP Y TO NEXT ROW OF VIC PATTERN
1CFC  10 F0             BPL BYTLUP      ;DO ALL 8

1CFE                SEND CONVERTED PATTERN TO PRINTER
1CFE  A2 00             LDX #0
1D00  BD 95 1D  OUTLUP  LDA PRTPAT,X    ;GET A DOT COLUMN
1D03  20 19 1D          JSR PUTCHR      ;SEND TO PRINTER
1D06  AC 9F 1D          LDY DOTFLG      ;DOUBLE DOT MODE?
1D09  C0 01             CPY #1
1D0B  D0 03             BNE NOZDOT      ;NO, SKIP
```

```
1D0D  20 19 1D          JSR PUTCHR       ;YES, SEND IT AGAIN
1D10  E8        NOZDOT  INX
1D11  E0 08             CPX #8           ;DONE ALL?
1D13  90 EB             BCC OUTLUP       ;NO, REPEAT
1D15  60                RTS

1D16            ;***    ASCOUT : ROUTINE TO SEND ASCII CHARACTER TO PRINTER

1D16  20 7A F2  ASCOUT  JSR VICOUT       ;SEND TO SCREEN

1D19            ;    SEND BYTE TO PRINTER
1D19  48        PUTCHR  PHA              ;SAVE CHARACTER
1D1A  A9 10             LDA #$10         ;TEST INTERRUPT BIT
1D1C  2C 1D 91  WAITO   BIT IFR1         ;IN FLAG REG
1D1F  F0 FB             BEQ WAITO        ;WAIT UNTIL IT TURNS ON
1D21  68                PLA
1D22  8D 10 91          STA IORB1        ;THEN SEND CHARACTER
1D25  60                RTS

1D26            ;***    INITOT : INITIALIZE PIA FOR OUTPUT

1D26  AD 1C 91  INITOT  LDA PCR1         ;GET PCR
1D29  29 0F             AND #$0F         ;CLEAR B PORT BITS
1D2B  09 A0             ORA #$A0         ;SET IT TO AUTO PULSE MODE
1D2D  8D 1C 91          STA PCR1         ;AND STORE IN PCR
1D30  A9 10             LDA #$10         ;DISABLE INTERRUPT
1D32  8D 1E 91          STA IER1
1D35  A9 FF             LDA #$FF         ;SET ALL BITS TO OUTPUT
1D37  8D 12 91          STA DDRB1
1D3A  A9 00             LDA #0           ;START WITH A NULL
1D3C  8D 10 91          STA IORB1
1D3F  60                RTS

1D40            ;***    INILIN : PREPARE FOR SENDING A LINE

1D40  A9 00     INILIN  LDA #0           ;CLEAR LCOUNT
1D42  8D 9E 1D          STA LCOUNT
1D45  A9 1B             LDA #ESC         ;START ESCAPE SEQ
1D47  20 19 1D          JSR PUTCHR
1D4A  AD 9F 1D          LDA DOTFLG       ;DOUBLE DOT MODE REQUESTED?
1D4D  C9 01             CMP #1
1D4F  D0 08             BNE ONEDOT       ;NOPE
1D51  A9 4C             LDA #'L'         ;YES, 960 MODE
1D53  A0 C0             LDY #<960        ;LOAD 960 INTO X AND Y
1D55  A2 03             LDX #>960
1D57  D0 06             BNE PUTREG       ;GO SEND
1D59  A9 4B     ONEDOT  LDA #'K'         ;480 MODE
1D5B  A0 E0             LDY #<480        ;480 INTO X & Y
1D5D  A2 01             LDX #>480
1D5F  20 19 1D  PUTREG  JSR PUTCHR       ;SEND CODE
1D62  98                TYA
1D63  20 19 1D          JSR PUTCHR       ;AND THEN COUNT
1D66  8A                TXA
1D67  4C 19 1D          JMP PUTCHR

1D6A            ;***    INITPR : STARTUP INITIALIZATION FOR PRINTER

1D6A  A2 00     INITPR  LDX #0
1D6C  BD 92 1D  IPRLUP  LDA PRTAB,X      ;GET A BYTE
1D6F  F0 06             BEQ IPDUN        ;QUIT IF 0
1D71  20 19 1D          JSR PUTCHR       ;SEND IT
1D74  E8                INX
1D75  D0 F5             BNE IPRLUP
1D77  AE 0C 03  IPDUN   LDX SYSA         ;GET A REG
1D7A  A9 09             LDA #LPI8        ;GET 8 LPI CODE
1D7C  E0 01             CPX #1           ;1=8LPI
1D7E  F0 08             BEQ PUTDEN       ;YES, 8LPI
1D80  A9 08             LDA #LPIGRF      ;LOAD GRAPHIC DENSITY CODE
1D82  E0 02             CPX #2           ;2=GRAPHIC DENSITY
1D84  F0 02             BEQ PUTDEN       ;YES
1D86  A9 0C             LDA #LPI6        ;ELSE DEFAULT TO 6 LPI
1D88  20 19 1D  PUTDEN  JSR PUTCHR
1D8B  AD 0D 03          LDA SYSX         ;SAVE DOT MODE FLAG
1D8E  8D 9F 1D          STA DOTFLG
1D91  60                RTS

1D92                 PRINTER PARM TABLES

1D92  1B        PRTAB   .BYT ESC,'A',0
1D93  41
```

```
PRTPAT  0257   0181 0173
PUTCHR  0194   0248 0237 0232 0230 0228 0217 0186 0182 0138 0113
PUTDEN  0248   0246 0243
PUTREG  0228   0224
QUOTMO  0006   0096 0084
RVSMOD  0005   0104
SAVPOK  0107   0105 0087
SEND    0143   0134 0116
SYSA    0019   0240
SYSX    0020   0249
TVCTL5  0015   0161 0153
VICOUT  0017   0192 0071 0058 0056
VICPAT  0007   0170 0167 0166 0160 0159 0149 0148 0145 0143
WAITO   0196   0197
X       0000   0235 0181 0173
Y       0000   0170
0255  1D94  00

0256  1D95                DATA AREAS

0257  1D95             PRTPAT *=*+8           ;PRINTER PATTERN AREA
0258  1D9D             ASAVE  *=*+1           ;CHARACTER TEMPORARY
0259  1D9E             LCOUNT *=*+1           ;CHARACTER IN LINE COUNTER
0260  1D9F             DOTFLG *=*+1           ;DOT MODE FLAG

0261  1DA0             LAST    .END
0262  1DA0              ERRORS= 0000

SYMBOL CROSS REF FOR VIC TO EPSON MX-80 INTERFACE   PAGE 05

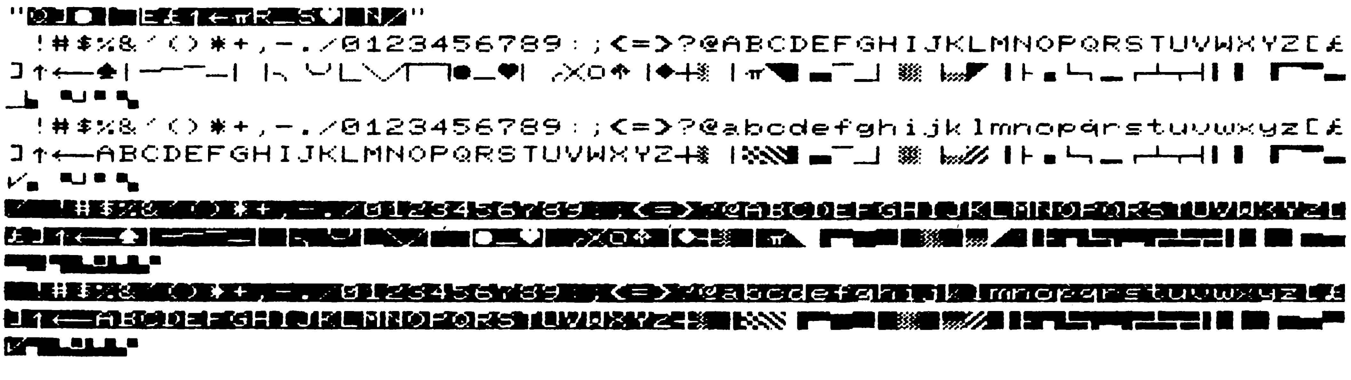
SYMBOL DEFINED REFERENCES

A       0000   0172 0165 0164
ASAVE   0258   0115 0107 0070 0064
ASCOUT  0192   0050 0048
BITLUP  0172   0176
BITOFF  0090   0075
BYTLUP  0170   0178
CKRVS   0104   0102 0089
CLOSE   0056
CR      0023   0090 0082
DDRB1   0010   0209
DISVEC  0021   0059 0057 0051 0049 0040 0038
DOTFLG  0260   0250 0218 0183
ESC     0025   0253 0216
FILLIN  0130   0136 0120 0060
FINLIN  0120   0091 0083
GRFBAK  0122   0118 0098 0095 0085
GRFOUT  0064   0039 0037
HIBIT   0106   0097
IER1    0013   0207
IFR1    0012   0196
INILIN  0214   0121 0114 0042
INITOT  0202   0047 0036
INITPR  0234   0041
INSDEL  0024   0094
IORB1   0009   0211 0199
IPDUN   0240   0236
IPRLUP  0235   0239
LAST    0261
LCOUNT  0259   0215 0135 0130 0117 0109
LF      0026   0137 0112
LINLIM  0027   0131 0110
LOWER   0103   0100
LPI6    0030   0247
LPI8    0029   0241
LPIGRF  0028   0244
MULT8   0147   0151
NOALT   0157   0155
NOCTL   0099   0093
NOT7F   0080   0078
NOTCTL  0088   0081
NOTFUL  0115   0111
NOZDOT  0187   0185
NXTLIN  0137   0132
ONEDOT  0225   0220
OPENA   0047
OPENG   0036
OUTLUP  0181   0189
PCR1    0011   0205 0202
PRTAB   0253   0235
```

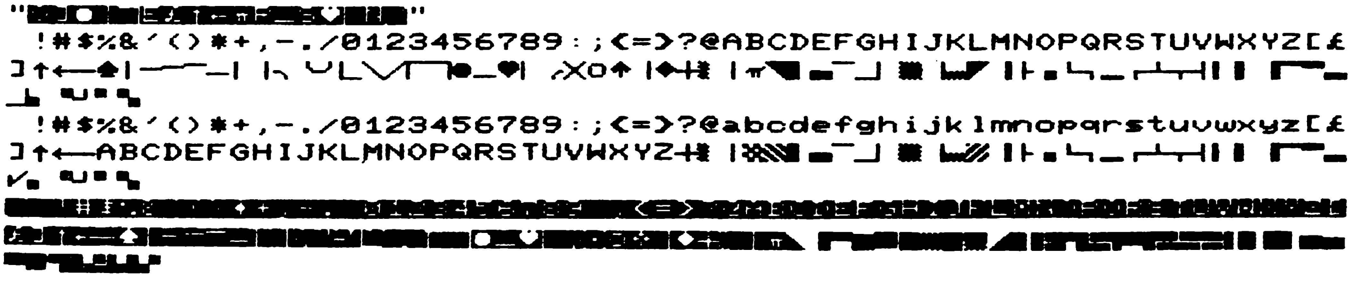
Listing 2: *The CHARACTER SET program will print the entire VIC-20 character set. You can select the print density and line spacing. A sample of each print mode is shown below the listing.*

```
100 REM PROGRAM TO PRINT ALL VIC CHARACTERS
110 INPUT "480 OR 960 MODE";MO$
120 IF MO$="480" THEN MO=0:GOTO140
130 MO=1:IF MO$<>"960" THEN 110
140 PRINT "6 LPI, 8 LPI OR"
145 INPUT "GRAPHIC";LP$
150 IF LP$="6" THEN LP=0:GOTO200
160 IF LP$="8" THEN LP=1:GOTO200
170 LP=2:IF LP$<>"G" THEN140
200 POKE 780,LP:POKE 781,MO:SYS(7168)
250 PRINT:PRINTMO$;" MODE AT ";
260 IF LP$="G" THEN LP$="GRAPHIC DENSITY":GOTO 280
270 LP$=LP$+" LPI"
280 PRINT LP$:PRINT
300 PRINTCHR$(34);"QJ● ▌E£↑←πR_5♥▌";
350 PRINT CHR$(14);CHR$(142);CHR$(34)
400 GOSUB1000
500 PRINT CHR$(14);:GOSUB1000
600 PRINT CHR$(142);CHR$(18);:GOSUB1000
700 PRINT CHR$(14);CHR$(18);:GOSUB1000
800 SYS(7202)
850 PRINTCHR$(142);
900 END
1000 FOR I=32TO 127
1010 IF I=34 THEN NEXTI
1020 PRINT CHR$(I);
1030 NEXTI
1100 FOR I=161TO191
1110 PRINT CHR$(I);
1120 NEXTI
1130 PRINT
1140 RETURN
READY.
```

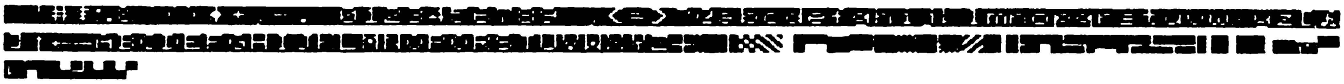
```
480 MODE AT 6 LPI
```



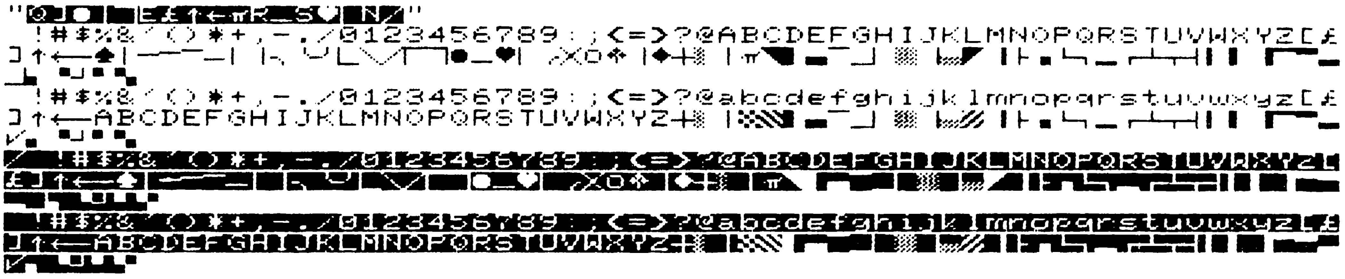
```
960 MODE AT 6 LPI
```



Listing 2 continued:

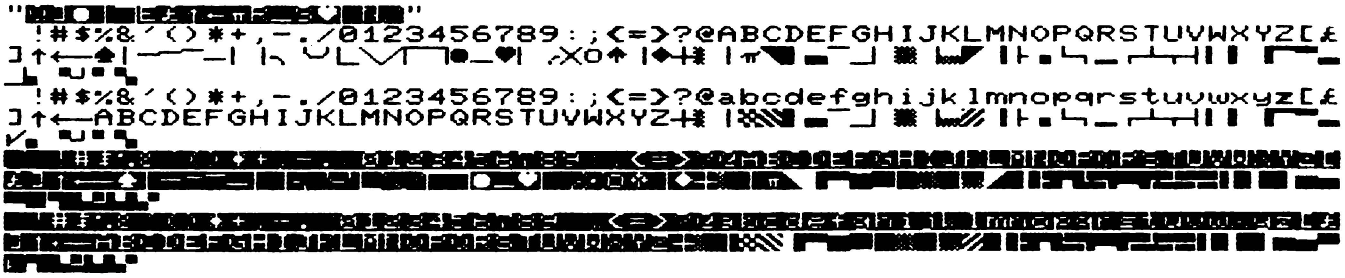


```
480 MODE AT 8 LPI
```



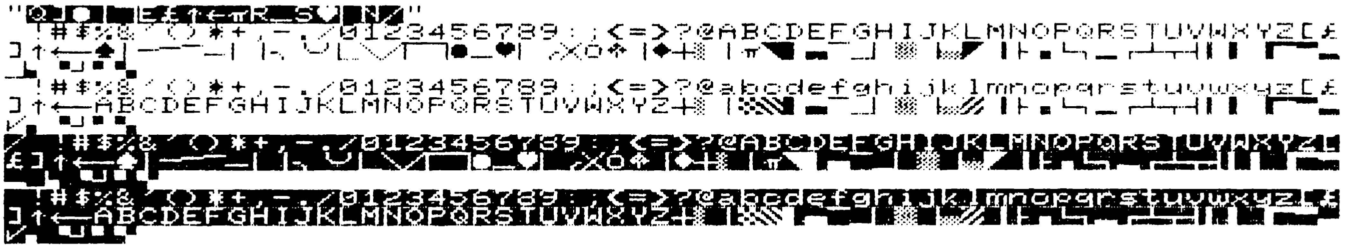
```
 !#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[£
 !#$%&'()*+,-./0123456789:;<=>?@abcdefghijklmnopqrstuvwxyz[£
]↑←ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

```
960 MODE AT 8 LPI
```



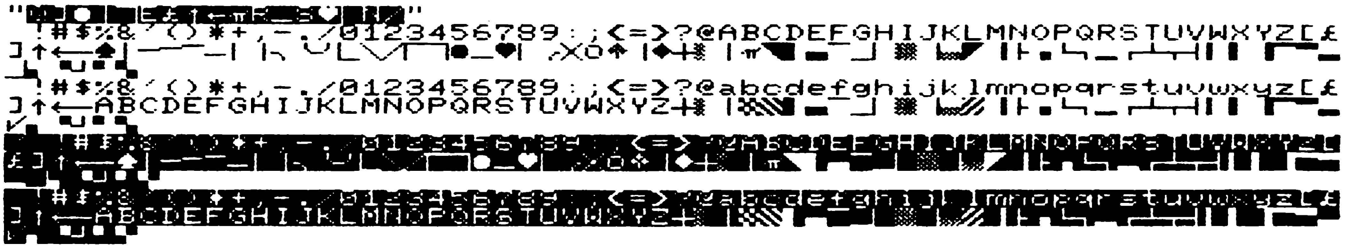
```
 !#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[£
 !#$%&'()*+,-./0123456789:;<=>?@abcdefghijklmnopqrstuvwxyz[£
]↑←ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

```
480 MODE AT GRAPHIC DENSITY
```



```
 !#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[£
 !#$%&'()*+,-./0123456789:;<=>?@abcdefghijklmnopqrstuvwxyz[£
]↑←ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

```
960 MODE AT GRAPHIC DENSITY
```



```
 !#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[£
 !#$%&'()*+,-./0123456789:;<=>?@abcdefghijklmnopqrstuvwxyz[£
]↑←ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

PART 5

Creating Attractive Screen Titles

by Michael S. Tomczyk

Reprinted from *Commodore Magazine,* August/September 1982

Displaying an attractive screen title is always a nice way to start a BASIC program. You can even let the user choose his own title, and display it dramatically when the program starts!

One thing to remember when choosing a title is to try to keep the length of the title less than 22 characters including spaces, because the VIC displays 22 characters on each line and your title will "spill over" to the next line if it's longer.

Centering your title

There are lots of ways to make attractive titles, but one of the easiest techniques is centering your title at the top of the screen when the program begins.

To center your title in the middle of a line, the first thing to do is count the number of characters in your title. Let's say your title is "VIC MAGICIAN."

□□□□□□□□□□□□□□□□□□□□□□
□□□□□VIC MAGICIAN□□□□□

This title has 12 characters including the space. Now subtract that total from 22 (the number of characters on one line). The answer (22-12) is 10. That means you have 10 spaces "left over" after PRINTing your title on the line. To center the title, you want to have an equal number of spaces on each side of the title, so next we divide the "left over" spaces by 2. Since 10/2 = 5 we know to put 5 spaces on each side of our title if we want to center it.

The following one-line program centers the title "VIC MAGICIAN" on the screen by CLEARing the screen and then PRINTing the title five spaces over from the left margin (To make each space in your program, press the long space bar once, quickly. Any space you include inside the quotation marks will appear as a space on the screen when the title is PRINTed. Notice that you don't have to worry about the spaces on the right side of the title because they're automatically left blank.)

Type this line and hit the RETURN key:

10 PRINT" SHIFT CLR/HOME SPACE SPACE SPACE SPACE SPACE VIC MAGICIAN"

The VIC uses "shorthand" to display the CLEAR command inside quotation marks, so when you hold down SHIFT and press CLR/HOME the VIC displays a reverse heart, which means "CLEAR." The spaces you typed appear as blank spaces, like this:

10 PRINT"♥   VIC MAGICIAN"

To display your title, type the word RUN and press the RETURN key.

If you have a problem or make a mistake, type LIST and hit RETURN, then retype the line.

Using the SPC Command

There's another way to put spaces in your BASIC programs... by using the SPC command. If you type PRINT SPC (5) your program will insert five spaces. Remember the SPC command is never enclosed in quotation marks but is always outside of the quotation marks... and you must always use the PRINT command before the SPC command. Here's how you can use the SPC command to PRINT the line you just typed:

10 PRINT" SHIFT CLR/HOME "SPC(5) "VIC MAGICIAN"

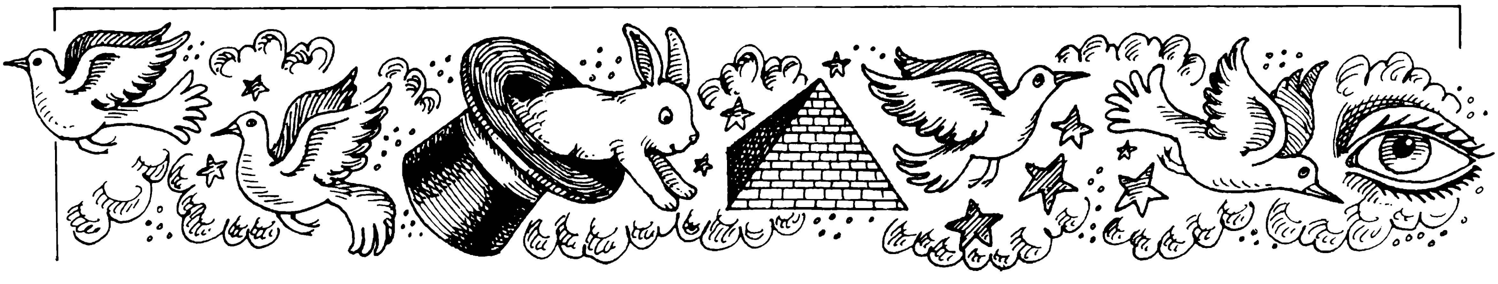
Here's another example of the SPC command:

10 PRINTSPC (5) "MOVES 5 SPACES"SPC(3) "MOVES 3 SPACES"

Displaying Your Title in Reverse

Now that you've created a title. Let's "dress it up" a little by reversing the title colors. To do this, you'll have to retype line 10. This time, just before you type the title, hold down the CTRL key and press the RVS ON key. This makes the title print in reverse when you RUN the program. Notice that when you hold down CTRL and press RVS ON, the VIC displays a REVERSE R. Type the following and hit the RETURN key:

TYPE THE "9" KEY



```
10 PRINT" SHIFT  CLR/HOME  SPACE
SPACE  SPACE  SPACE  SPACE  CTRL
RVS ON  VIC MAGICIAN"
```

The line you typed should look like this on the screen:

```
10 PRINT" ♥ R  VIC MAGICIAN"
```

Now type RUN and hit RETURN to see the new title. What if you want to reverse the whole line, including spaces? Type this line exactly as shown and hit RETURN, then type RUN and RETURN to see it:

```
10 PRINT" SHIFT  CLR/HOME  CTRL
RVS ON  [5 spaces] VIC MAGICIAN [5 spaces]"
```

This time we put the REVERSE ON command at the beginning of the first blank space and we added five blank spaces on the right side of our title. When you want to print reverse spaces (solid blocks) on the screen, you have to include all the spaces that you want to appear as solid blocks. That's why we include the right side spaces here.

Letting the User Choose a Title

One of the nicest cosmetic touches you can add to a title is letting the user choose his own title. The following program asks the user to type in a title, then centers it at the top of the screen. You can use these two lines at the beginning of any BASIC program.

```
10 PRINT" SHIFT  CLR/HOME  TITLE";:INPUTT$
20 PRINT" SHIFT  CLR/HOME ";:FORX = 1TO(22-LEN
  (T$))/2:PRINT " SPACE ";:NEXT:PRINTT$
```

After you enter this program, type the word RUN and hit the RETURN key. The screen will clear and say, "TITLE?" Type in a title and hit RETURN. The title appears automatically centered at the top of your screen.

The key here is using the INPUT statement in line 10 to define the title typed in by the user as T$. Now, in line 20, we can use a special BASIC command called LEN to determine the LENgth of T$. LEN (T$) counts the number of characters in the title, which was INPUT in line 10 as "T$".

Remember the centering formula we used at the beginning of the article? Well, this whole formula is included in line 20 like this: (22-LEN(T$))/2. If we use VIC MAGICIAN as our title, the LENgth is 12 characters, and (22-12)/2 = 5. So this formula gives us the number of spaces on one side of our centered title. (If you're wondering why we have two parentheses after T$, it's because all BASIC formulas must have the same number of left and right parentheses and the two right parentheses balance out the two left parentheses. This is an over-simplification but it's important to remember because one of the most common mistakes when creating formulas for calculation is not balancing left and right parentheses.)

Next, we use a counting command to tell the VIC to count five spaces and PRINT our title. We do this by saying FOR X = 1 TO 5 (remember our whole formula equals 5), PRINT a SPACE. The semicolon means print everything next to each other, and the NEXT command means "keep PRINTing a SPACE until the upper limit (5) is reached." After our five spaces are PRINTed, we PRINT T$, which is our title.

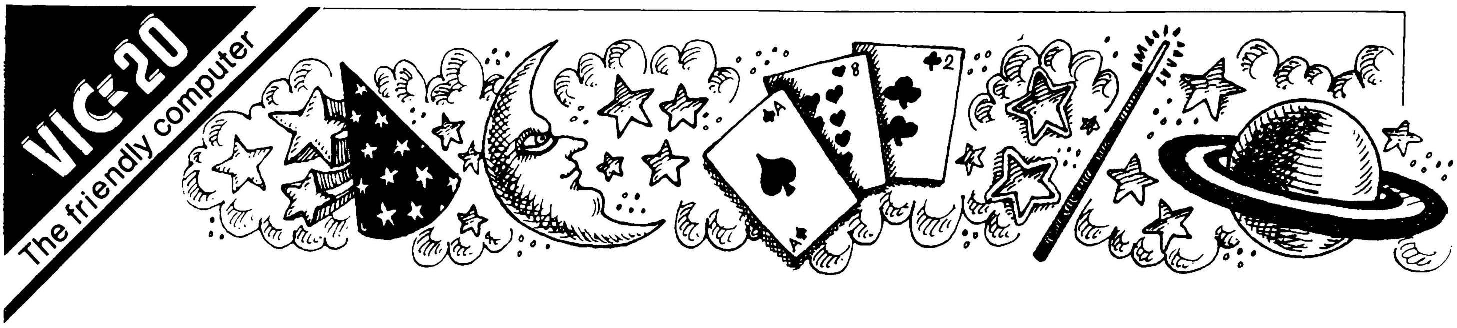
An Easy Way to Reverse a User Defined Title

The following program reverses the user-defined title and displays it at the top of the screen, flush left:

```
10 PRINT" SHIFT  CLR/HOME  TITLE";:INPUTT$
20 PRINT" SHIFT  CLR/HOME ";:PRINT" CTRL
  RVS ON " T$;:FORX=LEN (T$) TO21:PRINT
  " CTRL  RVS ON  SPACE ";:NEXT
```

Adding Colors to Titles

Another dimension you can add to your screen titles is color. The color command works just like the RVS ON command. Hold down the CTRL key and press the color key you want. The following program PRINTs a title in red, then returns the color to blue so the rest of the program will continue in blue. CTRL RED means hold down



the [CTRL] key and press the key marked [RED] on the keyboard:

TYPE THE "3" KEY

```
10 PRINT"[SHIFT] [CLR/HOME] TITLE";:INPUTT$
20 PRINT"[SHIFT] [CLR/HOME] ";:PRINT"[CTRL]
  [RVS ON] [CTRL RED]"
  T$;:FORX=LEN (T$) TO21:PRINT"[CTRL]
  [RVS ON] [SPACE] ";:NEXT:PRINT"[CTRL] [BLUE]'
```

TYPE THE "7" KEY

Experiment!

There are lots of other ways to create interesting screen titles. For example, try centering the title in the middle of the screen (hint: use the [CRSR DOWN] key in a PRINT statement, and the same centering formula we used for centering the title horizontally). You can also create borders around your titles, on both sides or on top and bottom, by using a graphic character.

Try putting graphic lines or bars above or below your titles, like this:

```
5 PRINT "[SHIFT][CLR/HOME]";:FORG = 1TO22:
  PRINT" [─] ";:NEXT
10 PRINT"VIC MAGICIAN"
20 FORG = 1TO22:PRINT" [─] ";:NEXT
```

insert above title

title line(s) here

insert below title

Hold down the SHIFT key and type the "C" key to get this graphic symbol

Here's another variation to try. This program centers a one-line title on the screen. Try changing the number 10 in line 20 to move the title higher or lower on the screen:

CRSR DOWN WILL APPEAR AS A REVERSE Q on your screen.

```
10 PRINT" [CLR/HOME] TITLE";:INPUTT$
20 PRINT" [CLR/HOME] ":FORX = 1TO10:
  PRINT" [CRSR DOWN] ";:NEXT
30 FORX = 1TO(22-LEN(T$))/2:PRINT" [SPACE] "
  ;:NEXTX:PRINTT$
```

Notice that in line 20 we told the VIC to PRINT ten CURSOR-DOWNs, moving the position of the cursor 10 spaces down. Then in line 30 we used our centering formula to center the title in the middle of the screen. You can include spaces, cursor up or down movements, Control Reverse On and Off, and Control Color commands... as long as you put them in quotation marks. Just PRINT them like any letter, number or graphic symbol and they will appear in your program.

As a final variation you might want to "announce" your title with a sound effect. Try putting this one-line program on the line immediately before the line that PRINTs your title:

```
25 POKE36878,15:FORM = 200TO250:POKE
  36876,M:NEXTM:POKE36876,0
```

Now you're on your own. Try different colors, sound effects, screen positioning, and other variations. C

ViewBAM and 1541 Disk Directory Programs

by Christopher Phillips

The following two programs are revised versions of programs found in the VIC-1541 User's Manual and on the TEST/DEMO disk.

Both programs are modified to allow selection of a unit number from 8 to 12. This provides selective access to any one of up to 5 disk drives daisy-chained together (the capacity of the VIC 20 and the Commodore 64).

The 64 View BAM program utilizes the 64's 40 column screen to display all 35 tracks of the disk on one screen.

The Disk Directory program has an added option of loading a program from the disk drive without having to exit the directory program.

Disk Directory

```
1 PRINT"JQQ█████████████B":PRINT"J";:INPUT"UNIT NUMBER";UNIT
2 IF UNIT<8 OR UNIT>12 THEN GOTO 1
3 CLOSE2:CLOSE15
4 OPEN2,UNIT,15
5 PRINT"J":GOTO 10000
10 OPEN1,UNIT,0,"$0"
20 GET#1,A$,B$
30 GET#1,A$,B$
40 GET#1,A$,B$
50 C=0
60 IF A$<>"" THEN C=ASC(A$)
```

```
70 IF B$<>"" THEN C=C+ASC(B$)*256
80 PRINT" "MID$(STR$(C),2);TAB(3);" ";
90 GET#1,B$:IF ST<>0 THEN 1000
100 IF B$<>CHR$(34) THEN 90
110 GET#1,B$:IF B$<>CHR$(34)THEN PRINTB$;:GOTO110
120 GET#1,B$:IF B$=CHR$(32) THEN 120
130 PRINT TAB(22);:C$=""
140 C$=C$+B$:GET#1,B$:IF B$<>""  THEN 140
150 PRINT LEFT$(C$,3)
160 GET T$:IF T$<>"" THEN GOSUB 2000
170 IF ST=0 THEN 30
1000 PRINT" BLOCKS FREE"
1010 CLOSE1:GOTO 10000
2000 IF T$="Q" THEN CLOSE1:END
2010 GET T$:IF T$="" THEN 2000
2020 RETURN
4000 REM DISK COMMAND
4010 C$="":PRINT">";
4011 GETB$:IFB$="" THEN4011
4012 PRINTB$;:IF B$=CHR$(13) THEN 4020
4013 C$=C$+B$:GOTO 4011
4020 PRINT#2,C$
5000 PRINT"▨";
5010 GET#2,A$:PRINTA$;:IF A$<>CHR$(13)GOTO5010
5020 PRINT"■"
10000 PRINT "D-DIRECTORY"
10010 PRINT ">-DISK COMMAND"
10020 PRINT "Q-QUIT PROGRAM"
10030 PRINT "S-DISK STATUS "
10040 PRINT "/-LOAD PROGRAM"
10100 GETA$:IFA$=""THEN10100
10200 IF A$="D" THEN 10
10300 IF A$="." OR A$=">" OR A$=">" THEN 4000
10310 IF A$="Q" THEN CLOSE 2:CLOSE15:END
10320 IF A$="S" THEN 5000
10340 IF A$="/" THEN GOSUB 11000:GOTO10000
10999 GOTO 10100
11000 INPUT"LOAD";B$:IF B$=""ORB$="E"ORB$="Q"ORB$="BYE"THEN B$="":RETURN
11010 CLOSE 2:CLOSE 15
11020 PRINT"▨▨LOAD";CHR$(34);"0:";B$;CHR$(34);",";UNIT:PRINT"▨▨▨RUNTTTTTTT";
```

ViewBAM

```
40 REM
50 REM ---VIEW BAM FOR COMMODORE 64---
70 REM
80 PRINT"▨▨■■■■■■■■■■■■■■■B":PRINT"▨";:INPUT"WHICH DRIVE";UNIT
```

```
85 IF UNIT<8 OR UNIT>12 THEN 80
100 REM ********************************
101 REM *      VIEW BAM FOR 64 DISK      *
102 REM ********************************
105 OPEN 15,UNIT,15
110 PRINT#15,"I0":NU$="N/A N/A N/A N/A N/A":Z4=1
120 OPEN 2,UNIT,2,"#"
130 Y$="█████████████████████████"
140 X$="████████████████████████████████████████"
150 DEF FNS(Z) = 2↑(S-INT(S/8)*8) AND (SB(INT(S/8)))
160 PRINT#15,"U1:";2;0;18;0
170 PRINT#15,"B-P";2;1
180 PRINT"███";
190 Y=24:X=1:GOSUB430
200 FORI=0TO20:PRINT:PRINT"██"RIGHT$(STR$(I)+" ",3);:NEXT
210 GET#2,A$
220 GET#2,A$
230 GET#2,A$
240 TS=0
250 FORT=1TO35:GOSUB450
260 Y=24:X=T+4:GOSUB430:GOSUB540:NEXT
270 REM GETZ$:IFZ$=""THEN270:PRINT"█ "
280 Y=24:X=1:GOSUB430
290 FORI=0TO20:PRINT:PRINT"██"RIGHT$(STR$(I)+" ",3);:NEXT
300 REM FORT=18TO35
310 REM GOSUB450
320 REM Y=24:X=T-13:GOSUB430:GOSUB540:NEXT
330 REM FORI=1TO1000:NEXT
340 PRINT"█";
350 PRINT#15,"B-P";2;144
360 N$="":FORI=1TO20:GET#2,A$:N$=N$+A$:NEXT
370 PRINT" "N$" "TS-17;"BLOCKS FREE"
380 PRINT"         <HIT ANY KEY TO EXIT>"
382 FOR I=1TO1000:NEXT:PRINT"█       BLOCK ALLOCATION MAP (BAM) "
385 GETZ$:IFZ$=""THEN385:PRINT"█ "
390 PRINT"█"
400 INPUT"████ANOTHER DISKETTE  N███";A$
410 IFA$="Y"THENRUN
420 IFA$<>"Y"THENPRINT#15,"I0":GOTO 1000
430 PRINTLEFT$(Y$,Y)LEFT$(X$,X)"█";
440 RETURN
450 GET#2,SC$:SC=ASC(RIGHT$(CHR$(0)+SC$,1))
460 TS=TS+SC
470 GET#2,A$:IFA$=""THENA$=CHR$(0)
480 SB(0)=ASC(A$)
490 GET#2,A$:IFA$=""THENA$=CHR$(0)
```

```
500 SB(1)=ASC(A$)
510 GET#2,A$:IFA$=""THENA$=CHR$(0)
520 SB(2)=ASC(A$)
530 RETURN
540 PRINT"■■"RIGHT$(STR$(T),1);"■□□";
550 REM  PRINTT"    "SC"  "SB(0)" "SB(1)" "SB(2)=CHR$(0),
560 IFT>24ANDS=18THEN:PRINTMID$(NU$,Z4,1);:GOTO660
570 FORS=0TO20
580 IF T<18THEN620
590 IFT>30ANDS=17THEN:PRINTMID$(NU$,Z4,1);:GOTO660
600 IFT>24ANDS=18THEN:PRINTMID$(NU$,Z4,1);:GOTO660
610 IFT>24ANDS=19THENPRINTMID$(NU$,Z4,1);:GOTO660
620 IFT>17ANDS=20THENPRINTMID$(NU$,Z4,1)::Z4=Z4+1:GOTO660
630 PRINT"■";
640 IF FNS(S)=0 THEN PRINT"+";:GOTO660
650 PRINT"■+";:REMRIGHT$(STR$(S),1);Z4,1);:GOTO72
660 PRINT"■■";
670 NEXT
680 RETURN
890 REM --- DISK COMMAND ---
900 OPEN15,9,15
910 INPUT"DISK COMMAND";C$:PRINT#15,C$
920 INPUT#15,E,ER$,E1,E2:IF E<20 THEN STOP
930 PRINT E:ER$;E1;E2:CLOSE15:STOP
1000 REM CLOSE15:LOAD"0:DIREC*",UNIT
```

HELPFUL HINTS

from Mervyn Beamish

At present I am up to my proverbials in the ruins of a giant man made space station fighting hordes of mutants – animal and vegetable. Writing Adventure games brings the best and worst of your programming skills to the surface.

Here are a couple of simple things that can save much time and frustration.

AUTO SAVE/ FREE MEMORY

If you are using 3040, 4040 (I think), 1540 or 1541 disk drive, start your program thus:

```
1 GOTO 4
2 SAVE "@0:filename",8:
  VERIFY "@0:filename",8
3 PRINT "FREE MEMORY:-";
  FRE(0) + 2↑16:STOP
4 REM
```

Then when you want a break from programming type:

GOTO 2

and you will automatically SAVE/ VERIFY your program. The @0: will overwrite any file of the same name on the disk. This stops you having to SCRATCH unwanted files or having a disk full of programs all only slight variations of the first.

Line 3 will tell you how much memory is left in your computer.

If during programming you just want to know your free memory – type:-

GOTO 3

MANUAL MERGE

If you have a small number of lines, (approx. 15 depending on computer), you wish to merge from one program to another, LIST them and renumber them to suit your other program. With the lines still on the screen, LOAD the second program. Before listing it HOME cursor and RETURN each line.

WACKO!! – But make sure that you don't accidently RETURN the LOAD command still at the bottom of the screen else you'll have to start again.

Next issue: How to make good use of memory space unused by BASIC without knowing a thing about machine language.

High Score

For serious game players who thrive on competition we are running this list of highest known scores for all Commodore games – cartridge and cassette. If you have a score that beats the existing record, send it in. But please remember you're on your honor, and phony scores will be on YOUR conscience, not ours.

Game	World's Highest	Australia/New Zealand's Highest
VIC AVENGER	13,000............. Andrew Patford Corio, VIC	5,940 .... Daren Legg, St Mary's. NSW
RADAR RAT RACE	122,720 .... Phillip Koschitzke Warracknabeal, VIC	
MOLE ATTACK	343 .... Phillip Salive, Massachusetts, U.S.A.	336 .... Micheal Kalokerinos Annerley, QLD
SLITHER	261...................... Amy Miles Mt Pleasant, MI	256............. Darren Mathewson Collinsville, Qld
OMEGA RACE	3 ships: 326,300 .... Barry Aitchison Commodore, Toronto 5 ships 260,050 .... Ben Piper, Chico, CA	313,400 .... John Gate Mount Isa, NSW
GORF	99,999............... Maree Mullin ?(Aust)	52,460 .... Brian Sutton, Stanhope.
GALAXIAN	21,000............. Andrew Patford	
ALIEN BLITZ	24,360................. David Hunt Ingle Farm, SA	6,135...................... Tim Ellis Parkville via Scone, NSW
PINBALL	1,500,000 .... Joe Ferrari, Commodore, Toronto	412,870 .... Greg Cahill, North Ryde, NSW
SUPER SLITHER	167 .... David Goldberg Richardson, Texas	
BLUE MEANIES	1,260 .... Alan S. Newman, Fairfield, CT	
VIC FROGGER	217010 .... D. G. Fry Duffy, ACT	
6 LANE DODGEMS	404 .... Brian Sutton, Stanhope. VIC	
GROUND ATTACK	2,760............ Jason Mathewson Collinsville, Q'ld	
SQUASH	7,352 .... Bruce Sutton, Stanhope, VIC	
LAZARIAN	1800 .... Damien Nelson East Malvern, VIC	
COSMIC CRUNCHER	1 085 610............... Paul Zsidy Bibela, Q'ld	
SPACE AVENGER MISSION 22	34,570 .... Dania Smith, Cambridge Park, NSW	
MONEY WARS	70,090................. David Hunt Ingle Farm, SA	41,390 .... Jason Mathewson Collinsville, Q'ld
GALACTIC CROSSFIRE	15,920........... Mark Freemantle Narellan, NSW	
UMI METEOR SHOWER	142,757 .... Mark Freemantle Narellan, NSW	
STORM	3,620........... Darren Mathewson Collinsville, Qld	
RAID ON FORT KNOX	8,600.................. Joseph Tilley Coomandook, SA	
CLOWNS	327,550 .... David Hunt Ingle Farm, SA	
MENAGERIE	2,200.................. David Hunt Ingle Farm, SA	
STAR BATTLE	28,400................ Colin Mullin ?(Aust)	
CASINO BLACKJACK	10,681........... Darrel Wadsworth Elizabeth Vale, SA	

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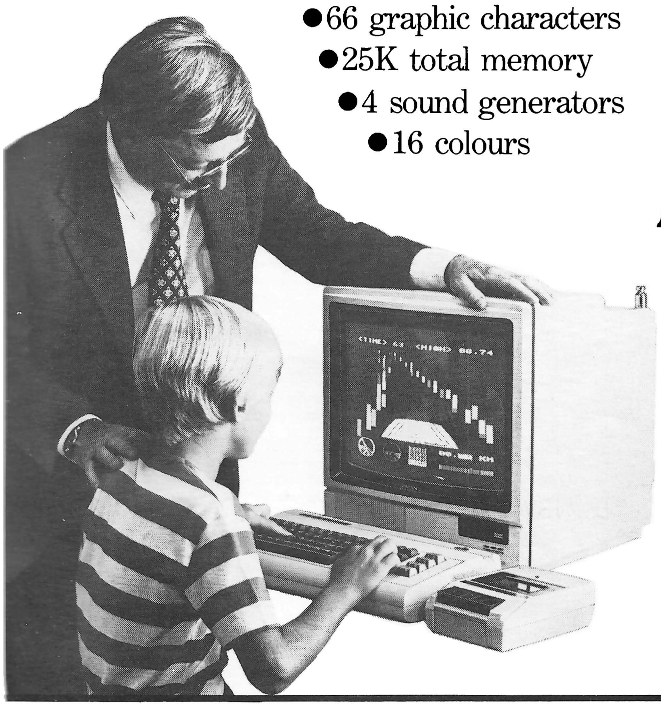

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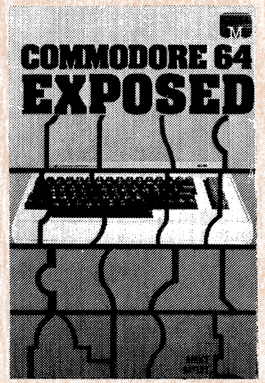

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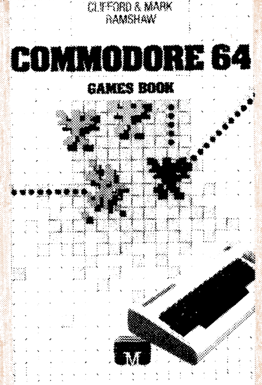

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